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FLOOD INSURANCE STUDY



**SACRAMENTO COUNTY,
CALIFORNIA**
UNINCORPORATED AREAS
VOLUME 1 OF 3



**ORIGINAL
COMPLETED**



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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
SACRAMENTO COUNTY, CALIFORNIA (UNINCORPORATED AREAS)

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the unincorporated areas of Sacramento County, California, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

This Flood Insurance Study revises and updates a previous Flood Insurance Study for the unincorporated areas of Sacramento County, California. This information will be used by Sacramento County to update existing floodplain regulations as part of the Regular Phase of the NFIP. The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence; and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers (COE), Sacramento District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement Nos. IAA-H-19-74, Project Order No. 18 and IAA-H-16-75, Project Order Nos. 4 and 4A3. This study was completed in March 1976. Additional hydrologic and hydraulic analyses performed by the COE, Sacramento District, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 32, Amendment No. 1, was completed for the City of Galt in May 1981.

Additional hydrologic and hydraulic analyses performed by the COE under Inter-Agency Agreement Nos. IAA-H-19-74, Project Order No. 18; and IAA-H-16-75, Project Order Nos. 4 and 4A3 for the Morrison Creek Stream Group Basin were completed in February 1985. A

restudy of tidal flooding in the Sacramento-San Joaquin delta area was performed by the COE under Inter-Agency Agreement No. IAA-EMW-E-1153, Project Order No. 1, Amendments No.22 and 22(a). This study was completed in November 1985.

1.3 Coordination

An initial coordination meeting was held on November 8, 1974, and was attended by representatives of FEMA; Sacramento County; the State of California; and the COE, Sacramento District. The purpose of the meeting was to inform county representatives of the initiation of the study, to familiarize them with the study, and to review the streams to be studied by detailed and approximate methods.

On January 19, 1976, an intermediate coordination meeting was held with representatives of the above organizations to review technical data on flood boundaries, floodways, and water-surface profiles.

The final community coordination meeting was held on January 24, 1977, and was attended by local officials, representatives of FEMA and the study contractor, and the public. Revisions due to changes in hydrology, pump-storage capacity, and pump-operating criteria for the Chicken Ranch and Strong Ranch Sloughs were generated as a result of this final meeting. The study was otherwise accepted without change.

The Sacramento County Water Resources Division (SCWRD) provided a list of county bench mark locations and elevations as well as plans for recently constructed bridges. Water-surface profiles, field-surveyed cross sections, and floodplains with floodways on 12 streams north of the American River were also provided. As the profiles were representative of a 10-year flood for a future condition assuming full development and full floodway containment, the information provided was not considered appropriate for this study. However, the cross sectional information was used. The SCWRD also provided as-built plans for creeks that had been modified by excavation and/or levee construction. Other valuable materials provided by the SCWRD included data on the locations and capacities of storm drain pumps and a tabulation of observed high-water marks.

Many of the streams in Sacramento County flow into the City of Sacramento or pass into the city and then reenter the county. The City Engineer for the City of Sacramento provided plans of channel and/or levee construction, information on the location of storm drain pumps, and a map showing the location and size of storm drain lines.

State Reclamation District 1000 provided information on the current locations and sizes of flood-control pumps in the district and the as-built sizes of drainage canals. Because these canals were excavated approximately 60 years ago, this information was used only as a guide and was superseded by field surveys.

Information on levees and pumping was provided by the American River Flood Control District. Flood-Prone Area Maps (Reference 1), 7.5-minute series topographic quadrangles (Reference 2), and rating curves for four stream gages in the southern portion of the county (Reference 3) were provided by the U.S. Geological Survey (USGS).

The California Department of Water Resources provided information on flooding potential in the delta area (References 4 and 5).

The California Department of Transportation, Office of Bridges and Structures, provided plans of bridges and channels constructed in conjunction with the interstate highway system.

The Southern Pacific and Western Pacific Railroads were contacted relative to data concerning flood problems, particularly in the southern portions of the county. However, they had no information on the effects of flooding on their facilities.

The Base Civil Engineer at McClellan Air Force Base provided plans for culverts and channels that run through that installation.

The U.S. Bureau of Reclamation (USBR) provided information on the operations plan for Nimbus Dam and information on future projects that might influence this study.

An initial coordination meeting for the Morrison Creek Stream Group revised study was held on September 14, 1983, and was attended by representatives of the City and County of Sacramento, FEMA, and the study contractor. An announcement of the intent to perform a flood elevation study in the Morrison Creek Stream Group Basin was published in the Sacramento Bee on November 30 and December 7 and 14, 1983. Direct contacts for information were made with representatives of the City and County of Sacramento. An intermediate/final coordination meeting attended by representatives of FEMA, the study contractor, the State of California, Sacramento County, and the City of Sacramento was held on November 2, 1984.

An initial coordination meeting for the restudy of tidal flooding in the delta areas and flooding along the Mokelumne River was held on July 25, 1983, and was attended by representatives of Contra Costa County, Sacramento County, San Joaquin County, Solano County, Yolo County, the State of California, FEMA, and the study contractor (COE). Flood Insurance, in general, and the Flood Insurance Study for the delta area and the Mokelumne River, in particular, were discussed. Information on study procedures and the types of data required to make the study were presented and the flooding sources and areas to be studied by detailed methods were identified. It was explained by the study contractor that the Delta portion of this study will be different from the normal flood insurance study for the following reasons:

- a. The hydraulic analyses will be based on stage-frequency relationship, backwater computations will not be used.

b. Only the 100-year flood conditions will be shown.

c. Floodways will not be developed.

In November 1983, a notice of study initiation, which contained a request for pertinent data, was sent to various Federal, State, and local agencies and individuals. An announcement of the intent to perform a flood elevation study in the delta area was published in the Sacramento Bee on December 14, and 21, 1983. Direct contacts for information were made with representatives of the California Department of Water Resources, the Contra Costa Planning Department, the SCWRD, the San Joaquin County Flood Control District, the San Joaquin Planning Department, the City of Lodi's Public Works Department, numerous reclamation districts, and architectural-engineering firms.

An intermediate/final coordination meeting was held on November 7, 1985. In attendance were representatives of the County and City of Sacramento, the State of California, FEMA, and the study contractor.

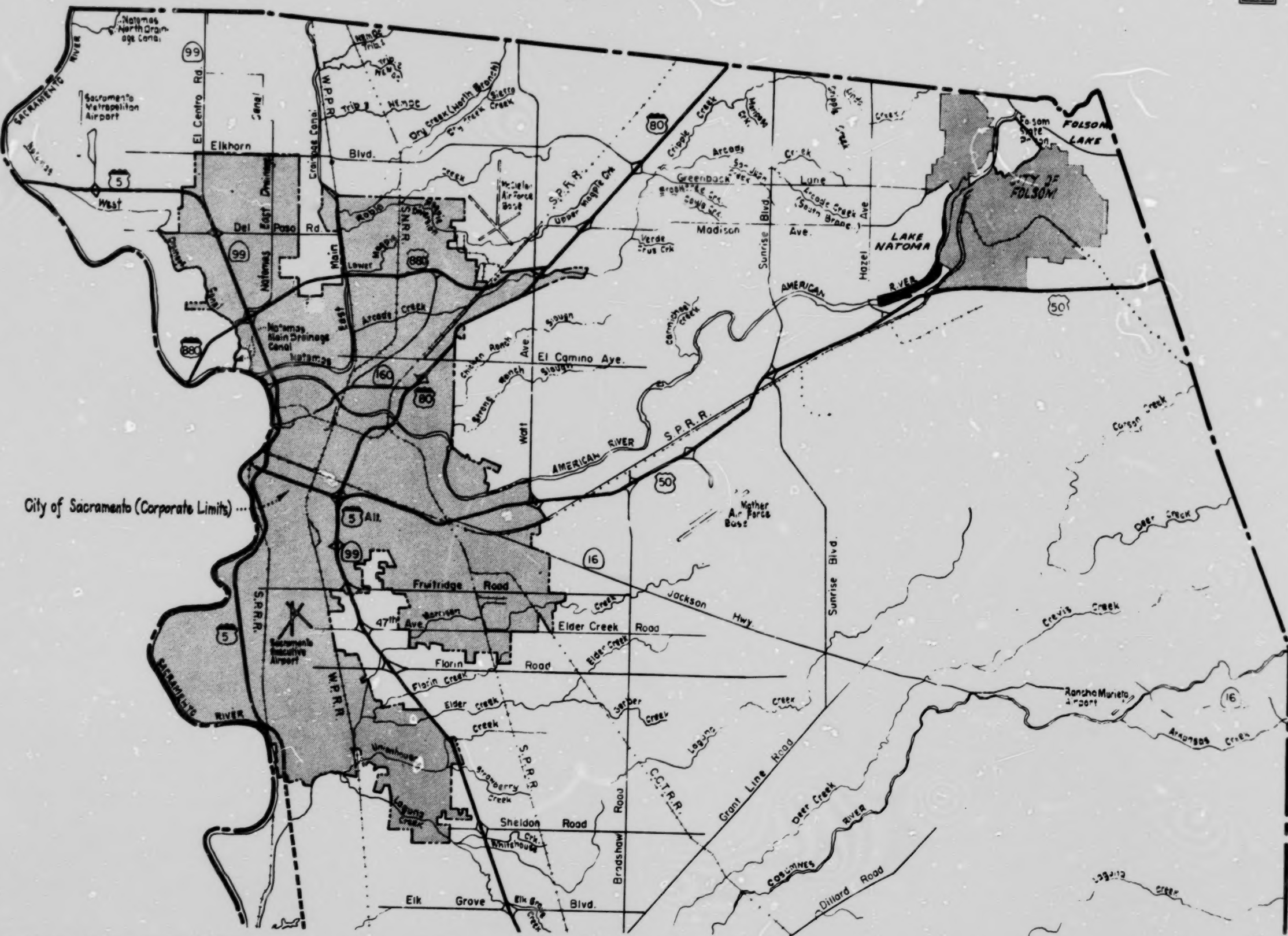
2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Sacramento County, California. The area of study is shown on the Vicinity Map (Figures 1 and 1A). The Cities of Folsom, Galt, Isleton, and Sacramento are excluded from this study.

All surface water originating in or passing through Sacramento County discharges to the Pacific Ocean via the Sacramento and San Joaquin Rivers, which join at the head of Suisun Bay, the easternmost arm of San Francisco Bay. With a combined tributary drainage area of approximately 60,000 square miles, these rivers provide most of the freshwater inflow to San Francisco Bay. The southwesterly sector of Sacramento County and the lower reaches of the Sacramento and San Joaquin Rivers are subject to the ebb and flow of the tides. Drainage patterns in Sacramento County are quite complex and, for purposes of this study, the streams and waterways under investigation have been divided into the following groups: Natomas Area Stream Group, American River Stream Group, Morrison Creek Stream Group, Sacramento River and the Delta Slough Group, and San Joaquin River Stream Group.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through 1991. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by the FEMA and the study contractor.



SEE FIGURE 1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA
(UNINCORPORATED AREAS)

FIGURE 1

APPROXIMATE SCALE (in miles)
2.5 0 2.5 5.0 7.5

VICINITY MAP

The following streams, listed by stream groups, were studied by detailed methods:

NATOMAS AREA STREAM GROUP

Natomas East Drainage Canal
Natomas Main Drainage Canal
Natomas North Drainage Canal
Natomas West Drainage Canal

AMERICAN RIVER STREAM GROUP

American River
Arcade Creek
Arcade Creek (South Branch)
Brooktree Creek
Carmichael Creek
Chicken Ranch Slough
Cripple Creek
Coyle Creek
Dry Creek
Dry Creek (North Branch)
Linda Creek
Magpie Creek
Mariposa Creek
Natomas East Main Drainage Canal
Natomas East Main Drainage Canal
Tributary 1
Natomas East Main Drainage Canal
Tributary 2
Natomas East Main Drainage Canal
Tributary 3
Robla Creek
San Juan Creek
Sierra Creek
Strong Ranch Slough
Verde Cruz Creek

MORRISON CREEK STREAM GROUP

Elder Creek
Elk Grove Creek
Florin Creek
Gerber Creek
Laguna Creek
Laguna Creek Tributary 1
Morrison Creek
North Fork Laguna Creek
Strawberry Creek
Unionhouse Creek
Whitehouse Creek

SACRAMENTO RIVER AND DELTA
SLOUGH GROUP

Georgiana Slough
Sacramento River
Sevenmile Slough
Steamboat Slough
Sutter Slough
Three Mile Slough

SAN JOAQUIN RIVER STREAM GROUP

Delta Cross Canal
Mokelumne River
North Mokelumne River
San Joaquin River
Snodgrass Slough

The following streams were studied by approximate methods:

Arkansas Creek
Badger Creek
Browns Creek
Carson Creek
Cosumnes River
Cosumnes River Overflow
Crevis Creek
Deadman Gulch
Deer Creek
Dry Creek

Hadselville Creek
Hen Creek
Laguna Creek
North Fork Badger Creek
North Stone Lake Tributary
Skunk Creek
South Stone Lake-North Tributary
South Stone Lake-South Tributary
Willow Creek

2.2 Community Description

Sacramento County lies mostly in the main alluvial trough of the Sacramento Valley, in the northern portion of the Central Valley of California. This is in the south-central section of the northern one-third of California. It extends into the low foothill region of the Sierra Nevada on the east; however, most of the county is extremely flat, and flat agricultural lands stretch away from the county on the west, north, and southeast. Leveed islands of the Sacramento-San Joaquin Delta adjoin the county in the southwest. The central portion of Sacramento County is approximately 80 miles northeast of San Francisco and 350 miles northwest of Los Angeles.

Prehistorically, the region that would ultimately become Sacramento County was inhabited by Indians of the Plains, Miwok, and Nishinan linguistic groups. The Cosumnes River divided these groups, with the Miwok to the north and the Nishinan to the south. Five Spanish expeditions penetrated the delta area before 1800, but the first significant exploration into the Sacramento River region took place under the command of Gabriel Moraga in 1808. Luis Arguello, who led a water-borne expedition up the Sacramento River in 1817, is generally credited with the first exploration of the present-day Sacramento area. The Old Sacramento Trail, which opened access to the Sacramento Valley from the north, was established by Jedediah Strong Smith in 1827 and 1828.

The first permanent settlement in Sacramento County was established by John Sutter in 1839. A fort that he built during the period from 1841 to 1844 as protection against hostile Indians also served as a trading post and was to be the center of an agricultural empire that he hoped to develop. Other settlers came to the area in the 1840s, and three large Spanish land grants in addition to Sutter's were made from 1841 to 1844. Discovery of gold in 1848, however, postponed agricultural development, as extensive mining operations were undertaken along the American and Cosumnes Rivers, and many settlers engaged in agriculture left the land to prospect in mining areas. As the Gold Rush Era faded away, an economy based on the true wealth of the county -- its deep, extensive, and very fertile alluvial soils -- began to develop.

Early agricultural activity was almost entirely concerned with livestock production. By 1850, when Sacramento County was established as one of the original 27 counties in California, small beginnings had been made in growing wheat, corn, barley, potatoes, and fruit. In the 1860s, the county was a combined livestock-and-grain-producing area. A severe drought in 1862 checked livestock production and led to increased emphasis on crops, which were grown where water for irrigation was readily available. These locations were within easy reach of large rivers, then the principal highways for transportation.

Both climate and soils were favorable to extensive production of grain, and this activity was soon extended beyond alluvial lands to the drier areas on the plains. By 1870, the production of wheat

and barley was the dominant agricultural activity. Around the turn of the century, as population and demand for land increased, large ranches were subdivided, and a transition to production of orchard and truck crops and alfalfa began. Assured irrigation supplies led to further diversification and production of a wide variety of crops that included alfalfa, apricots, asparagus, beans, cherries, grain sorghum, grapes, hops, olives, peaches, plums, rice, sugarbeets, and tomatoes. Beef cattle and sheep, which were grazed, and dairy cattle and poultry, which were intensively fed, made up the livestock production.

Diversified agricultural pursuits and related activities continue to be important in Sacramento County, but much of the county is now urban or urbanizing, and State and Federal establishments comprise the most significant segment of the county's economy. Government workers form a large and stable base for retail and wholesale trade and service-type industries.

Sacramento County experienced a 125-percent increase in population from 1950 to 1960. This tremendous rate of growth declined to 25 percent during the period from 1960 to 1970. Projections indicated that the population of the county would increase by approximately 1 percent annually, the same rate as the state as a whole, through 1980 (Reference 6). Its January 1980 population, excluding the City of Sacramento, was approximately 783,000. The City of Sacramento is the largest regional community, with a 1985 population of 309,400.

Residential development in Sacramento County is largely concentrated in an urban-suburban metropolitan area that extends in a widening fan shape from the City of Sacramento northeasterly to the county line. Rural subdivisions, single-family rural residences, and farmhouses are scattered throughout the remainder of the county, except in the delta area; in the delta area, there are few nonagricultural structures and practically no dwellings.

Commercial development in the county is largely located along main thoroughfares in the unincorporated metropolitan area or concentrated in shopping mall complexes in, or adjacent to, the metropolitan area.

Sacramento County is served by Interstate Highways 5 and 80, U.S. Highway 50, state highways, and county roads. Freeways and highways radiate from the City of Sacramento, with interconnecting bypass freeways along the periphery.

The county is served by Sacramento Metropolitan Airport, which is located along Interstate Highway 5, 11 miles northwest of downtown Sacramento, and by a number of general-aviation fields. Executive Airport in Sacramento, the largest of the general-aviation facilities, is located in the north fringe of the region.

Sacramento County is a major center of railroad activity. It is served by the mainlines of the Southern Pacific and Western Pacific Railroad Companies, both Class 1 railroads, and by the Sacramento Northern and Central California Traction Railroads. Spur lines run to many commercial and industrial installations that depend on railroad transportation.

The Sacramento Deep Water Ship Channel and the Port of Sacramento (which has facilities for bulk and containerized cargoes, modern wharves, and extensive warehousing areas) provide access to overseas markets. A shallowdraft navigation channel, which is 10 feet deep and from 150 to 200 feet wide, is maintained in the Sacramento River from Suisun Bay to Sacramento. Lesser depths and widths are maintained above that point.

In general, topography in Sacramento County is characterized by a broad band of very flat valley floor land in the western sector, a transition zone of gently sloping alluvial plains in the central sector, and a low foothill region in the eastern sector. Elevations range from below sea level in the delta island area in the southwest corner of the county to approximately 800 feet in the foothill region.

Much of Sacramento County is low and flat. Some areas of the county are so flat that they have essentially no slope at all. Natural drainageways in these areas are usually poorly defined, and drainage of storm waters is slow. Most of these areas lie in the western and southern portions of the county.

The general drainage pattern in Sacramento County is from northeast to southwest. As previously noted, all drainage is ultimately conveyed out of the county by the Sacramento and San Joaquin Rivers.

The approximate drainage areas of the major stream group areas studied by detail methods are as follows:

<u>Stream Group</u> <u>(Square Miles)</u>	<u>Drainage Area</u>
Natomas Area (Mouth)	90
American River (Mouth)	2,100
Morrison Creek (Mouth)	100
Mokelumne River (Mouth)	690

Slopes of the main drainageways in these areas increase from west to east, thereby reflecting the general topographic pattern of the county. Stream gradients vary from 0.5 foot per mile to 55 feet per mile and average approximately 10 feet per mile.

The Natomas Area Stream Group is situated in the northwestern portion of Sacramento County, in the area between the Sacramento River and the Natomas East Main Drainage Canal. This reclaimed floodplain, protected from external flooding by a levee system, has

an internal drainage system that depends on pumping into the Sacramento River.

The American River Stream Group drains the northeastern sector of Sacramento County. The river originates in the Sierra Nevada and flows southwesterly through the county. It joins the Sacramento River in the City of Sacramento. The principal tributaries of the American River included in this study are the Natomas East Main Drainage Canal, Arcade Creek, and Dry Creek.

The Morrison Creek Stream Group area lies south of the American River. The terrain in the basin, which slopes gently from northeast to southwest, is relatively flat with a drop in elevation of only about 300 feet over a length of approximately 20 miles. All stream flow in the basin drains to the San Joaquin River via Beach and Stone Lakes, Snodgrass Slough, and the Mokelumne River. Originally, runoff from the Morrison Creek Stream Group Basin drained into the Sacramento River. However, when levees were constructed along the Sacramento river the flows were diverted into Beach Lake.

The Sacramento River and Delta Slough Group includes a number of delta sloughs in the southwestern sector of the county and the Sacramento River from its junction with the San Joaquin River upstream to the northwestern corner of the county. The delta is a vast, low-lying, swamp-like region upstream from the confluence of the Sacramento and San Joaquin Rivers. It was interlaced by many streams and sloughs and largely covered by dense growths of tule and other marsh-type vegetation. Today, it comprises approximately 500,000 acres of rich agricultural lands reclaimed from swamp by levees and divided into approximately 100 tracts, locally known as islands. Land surfaces lie from approximately 10 feet below sea level in the central part of the delta to approximately 20 feet above sea level along its periphery. The whole region is subject to tidal influence. The boundaries of the delta are legally defined in Section 12220 of the California Water Code.

The San Joaquin River Stream Group comprises the Sacramento County reach of the San Joaquin River and those Sacramento County streams tributary to the San Joaquin River south of the Morrison Creek Stream Group. The principal tributaries are the Mokelumne River, Cosumnes River, Dry Creek, and Laguna Creek. (Note that the American River and San Joaquin River Stream Groups both have a Dry Creek and that the Morrison Creek and San Joaquin River Stream Groups both have a Laguna Creek.)

The Mokelumne River originates in the Sierra Nevada at about 10,000 feet elevation in its headwaters region. It flows west-southwesterly for about 90 miles to Lodi and then northwesterly for about 18 miles to the downstream study limits at Thornton. Overall, the study area is drained generally to the west; and the terrain is practically flat. Over the 38-mile river reach included in this study, the drop in elevation is only 80 feet (from 100 to 20 feet). The lower reach of the Mokelumne River west of Thornton

bifurcates after entering the delta, and both the North and South forks wind southerly to the join the San Joaquin River in approximately the center of the delta area.

Manmade alterations to the drainage regimen have been primarily in the form of levees to prevent flooding of adjoining lands. The levee systems have necessitated systems of pumps to discharge waters originating in protected areas. Levee systems are prevalent in the southern and western portions of Sacramento County.

Vegetation in the foothill areas is classified as woodland community. This is a composite of dense stands of trees and shrubs and open grasslands with scattered trees. Dominant plants comprise several species of oaktills and, at higher elevations, digger pine trees. Once much more extensive, the woodlands have been reduced by cutting for firewood and clearing to increase rangeland. Grazing effectively prevents reestablishment of woodlands.

Vegetation below the foothill woodlands is classified as grassland community, which is characterized by sparsity of trees. Grasslands surround the richer alluvial plains adjacent to major watercourses. Originally composed of perennial bunch grass and herbaceous plants, the grassland community is now dominated by annual grasses of Mediterranean origin. The native species were lost due to their inability to withstand intensive grazing. Impressive displays of wildflowers may be found in grassland areas in the spring. Vegetation along permanent and intermittent waterways (riparian community) may cover a corridor up to several hundred yards wide. Vegetation is comprised of broadleaf trees, usually dominated by cottonwood and valley oak trees, or thickets of shrubs, such as blackberry and wild rose.

The major bodies of water in Sacramento County are Lake Natomas and Folsom Lake (the most southerly portion). Both are on the American River. Folsom Lake is a 1,000,000-acre-foot, multipurpose storage facility built by the U.S. Army Corps of Engineers and operated by the U.S. Bureau of Reclamation as part of the Central Valley Project. Lake Natomas is the afterbay for a powerplant downstream from Folsom Dam.

The climate of Sacramento County is characterized by hot, dry summers and cool, moist winters. The lack of major physiographic variations within the county results in a nearly uniform climate for the area, with the exception of the delta, where cool ocean breezes keep temperatures lower than in other parts of the region, especially during the summer. Temperatures normally range from an average of 78°F in July to an average of 47°F in January. The overall annual monthly temperature is 62°F. Maximum temperatures reach almost 90°F and, occasionally, surpass 100°F during the summer. Winter temperatures rarely fall below 20°F. Annual rainfall varies from 13 inches in the delta to 25 inches near Folsom Lake. Most of the annual precipitation, approximately 98 percent, occurs from October through May. Violent thunderstorms

are extremely rare and snowfall is practically unknown. Generally, there are from 300 to 350 frost-free days per year.

Floodplain development in the Natomas Area Stream Group is very limited. The primary land use is agricultural. This area is protected from flooding from the Sacramento River, the American River, and the Natomas East Main Drainage Canal by a levee system.

Development in the San Joaquin River Stream Group and Sacramento River and Delta Area Slough Group floodplains is very limited. The primary land use is agricultural, and little urban use is foreseen.

In the American River Stream Group area, floodplain development consists of residential and commercial improvements along Carmichael Creek, Strong Ranch Slough, and Chicken Ranch Slough. Major thoroughfares and a sewage treatment plant are also located in floodplain areas. Much of the American River floodplain is developed as a park, which is compatible with flood stages.

In the northern portions of the American River Stream Group area, floodplain development consists of agricultural improvements, low-to moderate-density residential areas, and local commercial areas. Portions of McClellan Air Force Base, numerous thoroughfares, and a small general-aviation airport are also located in flood plain areas. This steadily urbanizing area is expected to continue to expand in urban uses.

Principal land uses in floodplains in the Morrison Creek Stream Group area are agricultural and rural residential. Agricultural lands are found primarily in the east, but also in the southwestern portion of the stream group area. Residential and accompanying local commercial uses predominate in the northwestern and central portions of the area. This area has been urbanized and is expected to continue to urbanize steadily.

2.3 Principal Flood Problems

Flooding can occur in Sacramento County anytime from October through April. Flooding results from prolonged heavy rainfall and is characterized by high peak flows of moderate duration and by a large volume of runoff. Flooding is more severe when antecedent rainfall has resulted in saturated ground conditions.

Cloudburst storms, sometimes lasting as long as 3 hours, occur over Sacramento County anytime from late spring to early fall, and they may occur as an extremely severe sequence within a general winter rainstorm. Cloudbursts are high-intensity storms that can produce peak flows equal to or somewhat greater than those of general rainstorms in portions of the study area. Flooding from cloudbursts is characterized by high peak flow, short duration of floodflow, and small volume of runoff.

2.3.1. Northern Sacramento County Area (Natomas Stream, American River, and Morrison Creek Stream Groups)

In urbanizing areas, flood problems are intensified because rooftops of homes and other structures, streets, driveways, parking lots, and other paved areas all decrease the amount of open land available to absorb rainfall and runoff, thus increasing the volume of water that must be carried away by streams. As indicated earlier, the northern portion of the county is urbanizing at a fairly rapid rate.

Indian legends and historical records indicate that at least nine major floods occurred in the Sacramento River basin during the 19th century. A great flood (described in Indian legend as having swamped the entire Sacramento River basin) occurred in 1805. Indians also described floods that occurred in 1825 and 1826 as widespread in the basin. Extensive flooding in northern California took place in 1839, 1840, 1847, 1849-1850, 1852, 1861-1862, 1881, and 1890. The flood of 1861-1862 was the largest known flood in Sacramento County.

One of the earliest reports of flooding in Sacramento County was the graphic account of Professor William H. Brewer of Yale University, who described the floods of January-March 1862 in the Sacramento area:

Nearly every house and farm over this immense region is gone. There is such a body of water--250 to 300 miles long and 20 to 60 miles wide, the water ice cold and muddy--that the winds high waves which beat the farm houses in pieces (Reference 7).

Substantial flooding in the county occurred in 1937, 1938, 1940, 1943, 1945, 1950, 1952, 1955, 1956, 1958, 1962, 1963, 1964, 1967, and 1969.

Floods on Dry Creek (American River Stream Group) have occurred with regularity since 1937. The October 1962 floods on Dry and Robla Creeks spread from 800 feet to approximately 1 mile wide. The flood of October 1962 was the largest that has been recorded at the Roseville gaging station, located on Dry Creek upstream of Sacramento County. Damage in the October 1962 flood was on the order of \$50,000. The resultant high water was within 2 feet of the top of the levee on the southern side of Robla Creek and along the Magpie Creek diversion channel. Floodwaters from Magpie Creek bypassed the upper portion of the diversion levee and flowed into lower Magpie Creek. Similar, less-severe floods occurred in 1955, 1958, February 1962, 1967, 1969, 1970, and 1973. Views of the 1962, 1967, and 1969 flood events in this basin are shown in Figures 2 through 5 (courtesy of the SCWRD).



Figure 2. View of Dry Creek Looking West From Dry Creek Road Along Curved Bridge Road on February 10, 1962.



Figure 3. View of Dry, Robla, and Magpie Creeks Flooding on January 22, 1967.



Figure 4. View of Natomas East Main Drainage Canal Flooding at Tributary 3 on January 22, 1967.



Figure 5. View of Natomas East Main Drainage Canal Flooding at Tributary 1 and 2 on January 22, 1969.

Other creeks in the American River Stream Group have floodplain boundaries similar to that of Dry Creek. The largest recent flood on Arcade and Cripple Creeks occurred in October 1962, with resulting damages of approximately \$10,000.

The largest recent floods on Strong Ranch and Chicken Ranch Sloughs occurred in February 1962. No damage estimates are available; however, runoff was too large for the channels and bridges, resulting in local flooding. The capacity of the American River pumping plant was exceeded for a short time, and floodwaters backed up and inundated areas in the vicinity of the nearby sewage treatment plant.

The most recent flooding on the American River occurred in February 1986. The peak flow during this flood has been estimated to exceed the current 100-year flood peak of 115,000 cubic feet per second (cfs).

Large portions of the Morrison Creek Stream Group area were flooded in 1952, 1955, 1958, 1962, and 1963. During the 1955 flood, overflow from the Cosumnes and Mokelumne Rivers caused inundation of the Beach-Stone Lake area, thus creating high backwater conditions on streams of the Morrison Creek Stream Group. Damage was estimated at \$213,000 in the Morrison Creek Stream Group area as a result of the 1955 floods and at \$204,000 from the 1958 flood. The floods of 1962 and 1963 caused an estimated \$161,000 in damage. The Morrison Creek Stream Group experienced lesser flooding in 1967 and 1969. The estimated damage for 1969 was \$159,000. Views of the 1962 flood event in this basin are shown in Figures 6 and 7 (courtesy of the Sacramento Bee). Views of the 1967 flood event are shown in Figures 8 and 9 (courtesy of the SCWRD).

In the Morrison Creek Stream Group Basin, the most recent flooding occurred in February 1986. That flood had the largest peak flow recorded on Morrison Creek (slightly higher than the January 1982 peak flow). Both the 1982 and 1986 floods have recurrence intervals of approximately 25 years. Flooding had also occurred in February 1973 and has a recurrence interval of approximately 10 years.

2.3.2. Southern Sacramento County (San Joaquin River and Sacramento River and Delta Slough Groups)

Historically, flooding along the Mokelumne River has been caused by general rainstorms in late fall and winter and by snowmelt runoff in spring and early summer. Cloudburst storms can also occur in the region; however, their effect on an area as large as the Mokelumne River basin is negligible.



Figure 6. View of Confluence of Laguna Creek and Elk Grove Creek,
Looking Southeast, on February 10, 1962.



Figure 7. View of Laguna Creek on February 10, 1962 (The State Fish Hatchery is in the Right Foreground).

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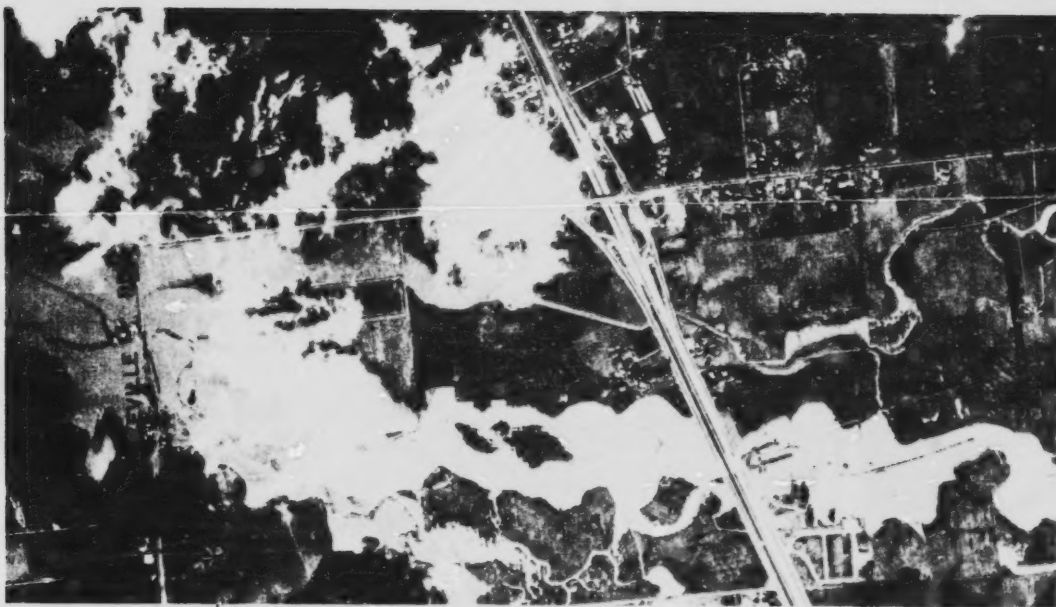


Figure 8. View of Laguna, Elk Grove, and Whitehouse Creeks Flooding on January 22, 1967.



Figure 9. View of Laguna Creek Looking West From Franklin Boulevard on January 22, 1967.

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Flooding on the detailed study reach of the Mokelumne River has occurred in 1907, 1909, 1911, 1914, 1921, 1925, 1928, 1937, 1950, 1952, 1955, 1963, 1964, 1967, 1969, and 1970. The most disastrous flood was that of November 1950, which caused about \$1.1 million in damages. The December 1955-January 1956 floodwaters caused an estimated \$3/4 -million in damages. The flood of December 1964 is the largest of record on the Mokelumne River. However, due to the completion of Camanche Dam in April 1964, all but several thousand dollars in damages were prevented. Contemporary accounts of floods on the Mokelumne River are essentially nonexistent. Streamflow records for the study reach of the Mokelumne were begun in 1904.

The lower reaches of the Sacramento and San Joaquin Rivers (delta) are under the influence of the tides. The most severe flood conditions in the delta would result when very high tides and large volume of stream outflow occur coincidentally, and strong onshore winds generate wave action. It should be noted that precipitation over the delta does not materially affect local flood conditions.

A fundamental flood problem in the delta results from the fact that for every square mile of land reclaimed, there is one square mile less of floodplain to contain the volume of the rising tide and outflow from the rivers of the Central Valley. Furthermore, the substructure of much of the Delta is overlain by a 20- to 50-foot thick layer of peat soil, which is ideal for agriculture but very poor as foundation or building material for levees. Peat soil dried out and exposed to air constantly oxidizes and subsides. As islands subside, water pressure in adjoining channels may become too great for levees to withstand and a section may fail. Also, levees are continually being eroded by stream outflow, tidal flow, and wave wash from winds and boat wakes. Increasing levee fill creates compression that may force underlying materials to rupture into the adjoining waterway or toward the land side of the levee. If one island is flooded and its levees are lost, the levees protecting an adjacent island becomes more vulnerable to the forces of waves and wind.

The Sacramento-San Joaquin delta area has a long history of flooding. Since construction of levees started in the early 1860's, every island has been flooded at least once due to levee overtopping or failure. Prior to 1950 most of the failures were due to levee overtopping. However, since the construction of many upstream dams, that flood factor has been reduced and now the major cause of flooding is levee instability. Approximately 110 levee failures have occurred since 1900, almost 45 since 1930, approximately 25 since 1950, and about 12 since 1980.

Little definitive data are available for specific flood events. However, records show that during the period from

1850 to the early 1900's, 13 of the many floods that occurred were outstanding events (1850, 1852, 1861-62, 1871, 1875, 1878, 1879, 1881, 1902, 1904, 1906, 1907, and 1909). Of the 13 floods, those that occurred in 1878, 1881, 1904, 1907, and 1909 were the most severe. Large portions of the delta were inundated and there was widespread and extensive damage. The most recent major flood events were those that occurred in 1950, 1955, 1964-65, 1969, 1972, 1980, 1982, and 1983.

The 1950 and 1955 floods were outstanding in peak outflows through the Delta and several islands were flooded. The 1955 floodflows inundated almost 38,000 acres, more than doubling the flooded acreage of 1950 (about 18,000), and caused about \$3.3 million in damages, compared to about \$1.2 million in 1950. In December 1964 and January 1965, the coincidental occurrence of very high tides and heavy inflow resulted in unusually high stages on all delta waterways. Concurrent strong onshore winds generated high waves that created very perilous conditions for many islands. Several hundred acres were flooded and damages, mainly flood fighting and repair of levees and levee roads, were a little less than \$1 million. In January and February 1969, high tides and adverse wave action in the delta combined with large river inflow and rain-soaked levees to cause the flooding of several islands and the endangerment of many other islands. Approximately 11,400 acres were inundated and flood damages amounted to about \$9.2 million. The levee separating Andrus Island and the San Joaquin River failed from unknown causes in June 1972 resulting in the flooding of Andrus and Brannan Islands (including the city of Isleton). High winds had occurred prior to the break, but there had been no antecedent rainfall and the tidal cycle was not on the higher side. About 15,000 acres were inundated and flood damages for the event approximated \$30 million.

In mid-January 1980, severe rainstorms over Central California precipitated high river outflow through the delta, which, coinciding with gale force winds over the Delta and high tides, resulted in the levee failure and flooding of two tracts (placing approximately 9,600 acres under water). Continued high inflow to the Delta and wind-generated waves increased erosion on all Delta levees, necessitating intensive flood fighting and the temporary curtailment of boat traffic. Then in late February 1980, three islands at the lower end of the Yolo Bypass and one additional tract were inundated.

Heavy inflow and strong winds caused by a major storm over California in late November 1982, in combination with high tides, resulted in widespread levee erosion and overtopping in the Delta and the flooding of an island and a tract. A succession of intense storms continued to batter the State until March 1983, establishing rainfall records for the Delta and tributary regions. Upstream reservoir releases were larger and sooner than anticipated due to the heavy rainfall

and a deep snowpack, worsening an already critical levee situation. Concurrently, extremely high tides prevailed in the delta along with wind-driven waves. Several levee failures occurred and eight islands/tracts were under water by late March 1983. More than 16,000 acres were flooded and the estimated associated damages amounted to more than \$20 million.

Floods on the Cosumnes River occurred in 1950, 1955, 1958, 1962, and 1964, with the events of 1955, 1958, and 1964 being most severe. In 1958, an estimated 38,000 acres of land were inundated along the Cosumnes River and the lower portions of Dry, Deer, and Laguna Creeks. In 1964, an estimated 30,000 acres of land were inundated.

2.4 Flood Protection Measures

Sacramento County lies at the confluence of the two major rivers that drain the entire Central Valley of California. Thus, it is afforded flood protection, either directly or indirectly, by essentially every flood-control project in the Central Valley. These include 17 major dams and reservoirs on main stem and tributary streams from the upper Sacramento River in Shasta County on the north to the Kern River in Kern County on the south. Other storage projects in the Central Valley are authorized but not started, under construction, or in preauthorization study stage. For purposes of this study, however, only those projects having immediate effect in Sacramento County are discussed. It should be noted that each flood-control storage project in the Sacramento and San Joaquin River basins comprises a unit of a comprehensive, integrated system that includes levees, channel improvements, floodway bypasses, and other improvements for flood control as well as storage projects.

Folsom Lake is the principal storage project affording direct flood protection to Sacramento County. Completed in 1956 by the U.S. Army Corps of Engineers and transferred to the USBR for operation and maintenance as a unit of the Central Valley Project, the Folsom Lake project is located on the main stem of the American River near the eastern edge of the county. It consists of a gravity-type concrete main dam with earthfill wing dams, an auxiliary dam, and eight earthfill dikes that impound 1,000,000 acre-feet of water for multiple purposes, including 400,000 acre-feet for flood control. Folsom Lake provides flood protection to the City of Sacramento and adjacent suburban areas, makes 500,000 acre-feet of water available for irrigation and municipal uses annually, and provides water for approximately 500 million kilowatts of hydroelectric power annually. The project has prevented damages estimated at \$110 million during floods that have occurred since its completion. It has high recreational-use potential and has been developed as a state park by the California Division of Beaches and Parks.

Auburn Dam and Reservoir, on the North Fork American River upstream from Folsom Lake, is an authorized and partially constructed

multiple-purpose project of the USBR. Construction has been temporarily suspended during a reexamination of the flood control function space allocation and for the acquisition of funding assistance from non-Federal sources. As initially authorized, the project consists of a concrete arch dam capable of impounding 2,300,000 acre-feet of water. It will significantly increase the level of flood protection in Sacramento by providing an additional 250,000 acre-feet of flood control storage that will be operated in conjunction with flood control space in Folsom Lake.

The Sacramento River Flood Control Project consists of a comprehensive system of levees, overflow weirs, pumping plants, bypass channels, and channel enlargement along the river from its mouth upstream to Chico Landing (Butte County); levees along the lower reaches of its direct and indirect major tributaries; and levees along certain major delta sloughs. A basic operational function of the project is the transfer of excess floodwater to leveed bypasses. Maintenance and operation of project works are the responsibilities of varied local interests. Principal improvements in Sacramento County are levees along the Sacramento River and the lower reaches of the American River, interceptor levees to channel interior flows from the northwestern and north-central sectors of the county to the American River, and levees along streamways of the Delta Slough Group. The project was originally authorized by the 1917 Flood Control Act. It has been modified and extended by various flood-control, river, and harbor acts since that time. Essentially completed in 1968, other comprehensive projects to preserve project integrity or extend and improve project works are ongoing. In total, the Sacramento River Flood Control Project has prevented flood damage estimated at almost \$9 billion (\$7.3 billion during the February 1986 floods) since 1950. Reduction of the flood hazard has permitted development of prosperous farming areas and growth of valley-floor towns on former swamplands and overflow lands.

Other Federal-interest improvements providing flood protection in Sacramento County are Camanche Reservoir on the Mokelumne River and the American River Levee Project. The American River levee extends along the northern bank of the river from the end of the Sacramento River Flood Control Project levee upstream to high ground near the community of Carmichael. Pumping plants to lift interior drainage into the river are also part of the project, which was completed in 1958. The project provides capacity to carry maximum non-damaging releases (115,000 cfs) from Folsom Lake. Damages prevented by the American River Levee Project are included in the figure for damages prevented by the Folsom Lake Project. The COE is restudying American River discharges and the capacity of the existing levee system to adequately convey flood flows.

Camanche Reservoir is located on the Mokelumne River in San Joaquin County, but modifies both the magnitude and timing of flood flows in the Sacramento County reach of the river, approximately 25 miles downstream of the dam. By reducing the backwater effect of the Mokelumne and Cosumnes Rivers on the Beach-Stone Lakes area and the

lower reach of Morrison Creek, the reservoir affords flood protection to lands in the western portion of the Morrison Creek Stream Group Basin.

The system of main and secondary drainage canals in the Natomas Area Stream Group was built by California Reclamation District 1000 in the early 1900s. It has been supplemented by pumping plants to allow collected drainage waters to be discharged to the Sacramento River over the levees of the Sacramento River Flood Control Project. Additional pumping capacity has been added to the system to offset the effects of urbanization in some portions of the area.

In addition to the previously mentioned federally financed protective works on the American River, local interests have provided flood-control works along portions of most of the creeks in the American River Stream Group area. These flood-control works consist of lined and unlined channels and enlarged bridge and culvert openings. Local criteria for flood-control facilities provide a lesser degree of protection than the 100-year regulatory flood used in the NFIP.

No Federal flood-control projects exist in the Morrison Creek Stream Group area. Local interests have improved Morrison Creek by enlarging the channel and/or constructing levees downstream of the Central California Traction Company Railroad (CCTCRR). A section of the channel upstream of this railroad has also been improved.

The COE, Sacramento District, is studying the flood control problems in the Morrison Creek Stream Group Basin. Major considerations of the investigation are: a dam and reservoir extending across the upper reaches of Elder and Laguna Creeks, a diversion channel from Morrison Creek to the reservoir area, levee and channel improvements, and a flood retardation basin in the Reach-Stone Lakes area at the downstream end of Morrison Creek.

The principal type of flooding in the Morrison Creek Stream Group Basin is sheetflow. Three main factors intensify the severity of flooding in the basin: backwater conditions, ponding, and the intermingling of floodwaters.

Overland flows caused by insufficient channel capacities result in substantial ponding of floodwaters, especially against obstructions such as road and railroad embankments and levees. Predominantly, the ponded floodwaters are deeper than the overland flood flows. Some ponding in areas close to bridges and culverts eventually subsides as adjacent channel flows decrease and the ponded floodwaters reenter the stream. Some floodwaters pond against obstructions and are diverted to subsequently mingle with flood flows in adjacent stream basins. In other areas the ponding remains for long periods of time until dissipated by evaporation and seepage.

There are five main areas of floodwater intermingling in the basin. Between the CCTCRR tracks and Florin-Perkins Road, Morrison Creek

overflows its south bank, and the floodwaters continue to the south for about one mile and mingle with Florin Creek overflows. Laguna Creek floodwaters overtop that creek's north bank just east of the CCTCRR tracks, flow into the east embankment of the tracks, and then continue northwesterly parallel to the embankment for about one and one-half miles and join Gerber Creek flows. Combined flood flows from Laguna and Gerber Creeks overtop the north bank of Gerber Creek just east of the CCTCRR tracks and flow northwesterly along the east embankment of the tracks for about one mile and then unite with Elder Creek flows. Gerber Creek flood flows overtop the creek's south bank about one-half mile west of the CCTCRR tracks, extend southwesterly for about one mile, and mix with Unionhouse Creek flood flows. In the western part of the basin between Franklin Boulevard and the Western Pacific Railroad tracks, floodwaters from various streams commingle.

Due to the rural nature of the Morrison Creek Stream Group Basin and the fact that it borders a major urban area (the City of Sacramento), which has received most of the detailed news and post flood survey coverage, little definitive data are available for specific floods. Contemporary accounts of floods on, and streamflow records for, the streams under study are essentially nonexistent. Records on Morrison Creek were begun in July 1959 and on Elder and Laguna Creeks in December 1981. The remaining eight streams do not have gages.

The Sacramento River basin is afforded flood protection indirectly by two water storage projects with Federal interest, which have flood control as a major function: Folsom Lake (as discussed earlier) and Camanche Reservoir. Levees along the American River downstream of Folsom Dam are currently considered to contain all flood flows up to the design flood of 115,000 cfs. However, larger flood flows would breach the levee on the south side of the river and then continue southwesterly through the Morrison Creek Stream Group Basin, thus flooding a large portion of the western half of the basin.

In the lower portions of tributary streams, floodwater elevations are increased due to the backwater effect from main streams. In the lower reaches of Morrison Creek, the backwater condition is a result of overflow from the Cosumnes River Basin into the Beach-Stone Lakes area, which, in essence, creates a hydraulic barrier and thus retards Morrison Creek flow into Beach Lake.

Local interests have also made discontinued improvements along Florin, Elder, Unionhouse, Whitehouse, and Elk Grove Creeks. Major improvements have not been made on Laguna, Strawberry, and Gerber Creeks.

No major flood-control projects exist on the Cosumnes River or its tributaries. However, California Reclamation District 800 built a levee along the north side of the Cosumnes River from near the Town of Sloughhouse to the Town of Wilton. In recent years, landowners, in conjunction with the U.S. Soil Conservation Service, have

constructed several levees along the river, primarily upstream of U.S. Highway 99.

Both the COE, Sacramento District, and the USBR have studied water-resources development problems of the Cosumnes River basin. The USBR has proposed a multipurpose reservoir at the Nashville site within this basin. Flood-control operations of this project would greatly reduce floodflows on the lower portion of the river. County Line Reservoir on Deer Creek above the Town of Sloughhouse, authorized as part of the U.S. Bureau of Reclamation Auburn-Folsom South Unit, would also help to prevent flood damage along Deer Creek and the Cosumnes River. These potential flood-control measures are still in the planning stages.

Local reclamation districts have constructed an outflow control at Lambert Road about one mile northeast of where South Stone Lake flows into Snodgrass Slough. During general rain floods in the Sacramento County region with recurrence intervals of less than 25 years, the structure prevents the inundation of the Beach-Stone Lakes area from backwater to Snodgrass Slough, which is caused by high flows on the Mokelumne River. Modification of this structure is included in the previously described COE study, which would increase the protection afforded the Beach-Stone Lakes area from Snodgrass Slough backwater up to greater than a 100-year flood.

Federal flood control efforts in the Mokelumne River basin consist of occasional repair of flood damaged levees and sporadic snagging and clearing.

All of the waterways under study in the delta area are leveed. These levees are classified as either direct agreement, project, or nonproject. Direct agreement levees were either constructed as part of a navigation project or rebuilt by the Federal Government after a flood and are maintained by local reclamation districts to Federal standards. These levees constitute only about 10 percent of the total levee system. Project levees were either constructed as part of a Federal flood control project. About 15 percent of the Delta levee system falls into this category and are maintained to Federal standards by local interests. Nonproject levees were privately constructed, are maintained by private owners or local agencies, and often receive minimal maintenance that is rarely performed to any kind of uniform standards. About 75 percent of the Delta levees are in this category.

Sacramento County has adopted a floodplain zoning ordinance that provides for floodplain zones along watercourses and describes limitations on land uses. The basic intent of the ordinance is to promote the wise and orderly development and beneficial use of lands subject to recurrent flooding, thereby minimizing potential flood damages and loss of life that could result from improper development and use of such lands. The portion of the ordinance dealing with urban uses in the floodplain places minimum elevation restrictions on new construction.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

Flood hydrographs and peak flows for the 10-, 50-, 100-, and 500-year floods for streams studied in detail were based on rainfall-runoff computations and statistical analysis of precipitation and discharge records at gaging stations. The areas studied in detail were broken into 78 small drainage basins and flood hydrographs were computed for each basin. Individual basin hydrographs were then combined and routed downstream to produce hydrographs at selected catch points on the streams under study. The COE standard project rainfall and flood concept and the unit hydrograph method of analysis were used in making rainfall-runoff computations. Streamflow routings were based on storage-discharge relationships developed for reaches along each of the streams.

Standard project rainfall was based on criteria presented in either Standard Project Rainflood Criteria (Reference 8) or Standard Project Criteria for General and Local Storms, Sacramento-San Joaquin Valley, California (Reference 9). It was found that general rainstorms produced the most severe flood conditions for the Morrison Creek Stream Group; Dry Creek; the lower reaches of Arcade, Cripple, and Robla Creeks; Chicken Ranch and Strong Ranch Sloughs; the Natomas East Main Drainage Canal; and the American River in the American River Stream Group. For all other streams studied in detail, local cloudburst storms produced the most severe flood conditions.

Computed standard project floods were used in conjunction with statistical analysis, using the log-Pearson Type III method (Reference 10), of available streamflow data to develop floodflow-frequency curves at three stream gage locations.

<u>Gage</u>	<u>Drainage Area (Square Miles)</u>	<u>Period of Record</u>
Arcade Creek near Del Paso Heights	31.5	1964-1974
Dry Creek at Roseville	78.2	1950-1974
Morrison Creek near Sacramento	58.4	1960-1974

One-day volume ratios of the computed standard project flood, developed from the floodflow-frequency curves, were used to determine the 10-, 50-, 100-, and 500-year flood events in areas where the general rain was the governing precipitation event.

Rainfall amounts for computation of cloudburst floods other than the standard project flood were developed from a precipitation frequency analysis of the Sacramento Weather Service Office precipitation station (period of record 71 years). Cloudburst precipitation over any basin was based on the ratio of the normal annual precipitation for the basin to that of the precipitation station.

Unit hydrographs were used on modified S graphs previously used in a Flood Plain Information report for Dry Creek (Reference 11). Loss rates were based on reconstitution of historical flood events at stream gages in the study area.

The effects of channel and valley (overbank) storage on floodflow rates were determined by developing storage-discharge relationships for reaches of each stream. The storage-discharge relationships were developed by computing a series of water-surface-elevation profiles for various flow rates and determining the storage in the reach for each outflow rate. Flood hydrographs from smaller drainage basins were combined and routed downstream using the Modified Puls routing procedure.

The effects of pumped discharges from the smaller basins were also accounted for during the routing process. These effects were particularly significant along the lower portions of Morrison Creek. Overland flows caused by spills of excess floodwaters from one creek to another were routed overland using the Modified Puls procedure with the storage-discharge relationship based on normal-depth computations supplemented by field inspection.

Because of the significant effects of the valley storage in much of the area studied by detailed methods, the Modified Puls procedure of routing was again performed after preliminary floodways were computed. The floodways altered the storage-flow rate

relationships, which, in turn, altered the flow rates found from the routings.

The floodway delineation and the revised routings were repeated until floodway criteria were met using the increased flow rates. In most of the detailed-study areas, the effects of the floodway on valley storage were very minor; however, in the Morrison Creek and Natomas Area Stream Group areas, the effects were significant.

Peak flows on the American River were determined from the flood-control operating rules for Folsom Dam and by routing the 500-year flood through the reservoir. The 10-, 50-, and 100-year peak flows are all equal to 115,000 cfs, as these floods are controlled by the dam. The routing of the 500-year flood yielded a peak flow rate of 425,000 cfs downstream from the dam.

The hydraulic regimen of the Sacramento-San Joaquin Delta combines two diametrically opposed water movements. These opposed water movements are the result of Pacific Ocean tidal action and inflow from tributary river basins. Further complicating the complexities of the hydraulic system are the numerous interconnecting channels; withdrawals of water by Federal, State, and local agencies; and the variability of Delta inflow. The continual interaction of these system elements causes a constant change in the water-surface throughout the Delta. Tidal action, tributary basin runoff, and meteorologic conditions are the major factors influencing water-surface elevations in the Delta area of the county. Analyses were carried out to establish the peak elevation-frequency relationships for each flooding source studied in detail affecting the Delta area.

Frequency analyses of water-surface elevations for the Sacramento River, Georgiana Slough, Streamboat Slough, Sutter Slough, the lower reach of San Joaquin River, and North Fork Mokelumne River were performed using the higher-high stage records of 24 gaging stations located throughout the Delta area (Reference 12). The selected period of record for the analyses (1945 to 1974) is subsequent to construction of Shasta Dam on the Sacramento River and covers the maximum length of record for the majority of the gages. Also, the Delta hydraulic pattern has not changed significantly during that period. For continuity among the gages used in this study, all gage data were adjusted to a datum of zero elevation, National Geodetic Vertical Datum (NGVD) of 1929.

Originally, the stage data were statistically analyzed using the Pearson Type III distribution method included in U.S. Water Resources Council guidelines (Reference 13). The resultant curves did not reflect either levee overtopping or levee breaks resulting in extensive areal inundation. Therefore, the shape of the curves was graphically developed to include those conditions. The stage-frequency relationship for each gage was compared with the stage-

frequency relationships developed for adjacent gages and, if necessary, adjusted to obtain consistency. Stage data from the study by the COE reflected a static water condition that included wind set and any other hydrologic action that tended to build up stage levels, but not wave action (Reference 12).

Flood Elevations on ungaged watercourses in the Sacramento-San Joaquin delta area were determined using a tidal hydrodynamics computer model (Reference 14). Based on a network of nodes and a grid of channels connecting the nodes, the model solves two basic equations of one-dimensional dynamic fluid flow. The first is the equation of continuity; the second is the equation of motion. Through numerical integration of these equations using the modified Runge-Kutta or modified Euler methods, the model computes water-surface elevations.

The Sacramento-San Joaquin delta to the Golden Gate is represented on two grid systems. The coarse grid contains some 250 nodes connected by 325 channels; the fine grid contains 1,200 nodes and 1,800 channels. In addition to physical parameters of the individual channels, the model uses inflow, overflow, evaporation losses, tidal elevations and wind velocity to solve for water-surface elevations. It must be noted that wave action may increase the 100-year flood stage by 1.5 to 2.0 feet.

Peak flows for flows of selected recurrence intervals on the Mokelumne River were based on analyses of streamflow records (Mokelumne River gage below Camanche Dam, period of record 1904 to present) or were synthetically derived from precipitational-runoff computations. Statistical data used to formulate natural (without upstream regulation) flow-frequency curves were computed utilizing the methodology outlined in an HEC Regional Frequency program (Reference 15). Peak Flow frequency curves for the Mokelumne River below Camanche Dam under existing project conditions were then developed based on operation records of Camanche Dam (1964 to 1979 but representative of a long period of record) and hypothetical data generated during the development of a Standard Project Flood (SPF) for the drainage basin above Camanche Reservoir.

An SPF would result from the most severe combination of meteorological and hydrological conditions considered reasonably characteristic of the geographic area in which the drainage basin is located, excluding extremely rare combinations. The 96-hour general rain SPF was evaluate and precipitation amounts and distribution were computed according to the methodology in Reference 16.

The computational methods and techniques used are acceptable procedures for hydrologic analyses and produced results considered reasonable. Unexpected findings were not encountered in carrying out the hydrologic analyses for this Flood Insurance Study.

Peak discharge-drainage area relationships for the stream by detailed methods are shown in Table 1.

TABLE 1. SUMMARY OF DISCHARGES

Flooding Source And Location	Drainage Area (square mile)	Peak Discharges (cubic feet per second)			
		10-Year	50-Year	100-Year	500-Year
American River	1,800.0	100,000	115,000	115,00	425,000
Arcade Creek	18.0	1,800	2,650	3,100	4,800
	33.0	2,800	4,100	4,700	6,250
	40.0	2,900	4,280	5,000	6,750
Arcade Creek South Branch	26.0	350	740	950	1,440
Brooktree Creek	3.5	540	1,200	1,540	2,320
Carmichael Creek	32.0	362	837	1,045	1,650
Chicken Ranch Slough	41.3	550	860	1,030	1,380
Coyle Creek	1.6	365	720	920	1,360
Cripple Creek	10.0	960	1,460	1,720	2,680
Dry Creek	87.0	4,400	8,000	9,980	16,900
Dry Creek (Near Galt)	24.0	155	245	315	425
Dry Creek (North Branch)	115.0	4,725	9,000	11,500	19,250
Lower Magpie Creek	4.5	460	950	1,150	1,860
Elder Creek					
Elder Creek Road	3.73	525	730	810	1,105 ¹
Central California Traction Company RR	7.77	700	985	1,100	1,725 ¹
Elk Grove - Florin Road	13.99	1,055	1,695	1,980	3,115 ¹
State Highway 99	16.49	1,025	1,665	1,935	3,135 ¹
Morrison Creek	22.32	1,225	2,015	2,240	3,565 ¹
Elk Grove Creek					
Southern Pacific RR	4.70	275	365	405	560
Laguna Creek	7.74	655	920	1,020	1,390
Florin Creek					
Florin-Perkins Road	1.80	150	200	220	300
Southern Pacific RR	1.90	275	550	650	1,540
Power Inn Road	2.55	335	970	1,130	2,070
Elder Creek	4.52	420	870	1,005	1,830

¹ Basin 500-year flow does not include American River 500-year overflow.

TABLE 1. SUMMARY OF DISCHARGES (cont.)

Flooding Source And Location	Drainage Area (square mile)	Peak Discharges (cubic feet per second)			
		10-Year	50-Year	100-Year	500-Year
Gerber Creek					
Vineland Road	1.35	205	280	310	515
Central California					
Traction Company RR	3.69	455	845	1,070	1,775
Elder Creek	5.00	455	690	870	1,220
Laguna Creek					
Excelsior Road	17.97	1,556	2,305	2,580	3,635
Central California					
Traction Company RR	19.71	1,205	1,500	1,585	1,790
Waterford Road	30.15	1,405	2,070	2,350	3,465
State Highway 99	32.45	1,405	2,080	2,355	3,335
Franklin Road	47.00	1,645	2,505	2,840	4,540
Morrison Creek	48.30	1,650	2,505	2,840	4,555
Laguna Tributary No. 1					
Laguna Creek	6.11	645	865	950	1,430
North Laguna Creek					
Laguna Creek	1.50	155	180	195	235
Linda Creek	7.8	680	1,140	1,820	2,800
Magpie Creek	2.7	340	440 ¹	490 ¹	610 ¹
Magpie Creek Diversion	9.0	750	1,500	1,880	2,400
Mariposa Creek	2.2	260	510	650	1,030
Morrison Creek					
Excelsior Road	12.61	885	1,290	1,450	2,170 ²
State Highway 16	22.27	1,705	2,270	2,755	3,985 ²
Central California					
Traction Company RR	29.02	1,925	2,665	2,855	4,010 ²
Southern Pacific RR	30.91	1,375	1,510	1,555	1,960 ²
Downstream of State					
Highway 99	43.43	2,340	3,155	3,395	4,235 ²
Western Pacific RR	67.53	3,450	4,845	5,315	6,415 ²
Sacramento River	110.65	4,280	6,635	7,410	11,025 ²
Natomas East Drainage					
Canal	33.0	400	650	690	730

¹ Excluding overflow² Basin 500-year flow does not include American River 500-year overflow.

TABLE 1. SUMMARY OF DISCHARGES (cont.)

Flooding Source And Location	Drainage Area (square mile)	Peak Discharges (cubic feet per second)			
		10-Year	50-Year	100-Year	500-Year
Natomas East Main Drainage Canal	150.0	5,000	10,750	11,200	17,600
Natomas East Main Drainage Canal Tributary 1	3.8	310	650	850	1,320
Natomas East Main Drainage Canal Tributary 2	7.7	300	600	740	1,050
Natomas East Main Drainage Canal Tributary 3	2.6	210	460	570	910
Natomas Main Drainage Canal	60.0	520	870	950	1,180
Natomas North Drainage Canal	2.5	720	1,500	1,900	2,960
Natomas West Drainage Canal	27.5	125	225	270	370
Robla Creek	17.0 ¹	720 ¹	2,700 ¹	2,900 ¹	7,000 ¹
San Juan Creek	2.3	330	650	920	1,400
Sierra Creek	3.0	190	340	430	730
Strawberry Creek Unionhouse Creek	4.37	430	590	655	955
Strong Ranch Slough	9.0	1,190	1,970	2,390	3,425
Unionhouse Creek Southern Pacific RR	2.67	325	535	615	1,105
State Highway 99	4.06	420	600	675	1,265
Strawberry Creek	8.43	830	1,125	1,255	2,020
Morrison Creek	11.47	975	1,420	1,560	2,410
Verde Cruz Creek	18.0	450	920	1,175	1,240
Whitehouse Creek Laguna Creek	2.53	310	380	405	510

¹ Excluding overflow

The 500-year flood on the American River overtops the levee system on the southern side of the river, and the overflow waters proceed southwesterly to the Beach-Stone Lake area. The extremely large flow rate (approximately 120,000 cfs) makes this overflow the governing 500-year flood event on many of the streams in the Morrison Creek Stream Group.

Morrison Creek overflows to Florin Creek during the 50-, 100-, and 500-year flood events. Because of the timing of the peak overflow rate and the timing of peaks on the two creeks, only the 500-year flood overflow effects the peak flow rate on Florin Creek. The 500-year overflow from the American River produces the governing 500-year event on both of these creeks.

Overbank storage on Chicken Ranch Slough causes a reduction in peak flow rates.

Magpie Creek has an overflow to Arcade Creek just upstream of McClellan Air Force Base. The embankment of the Southern Pacific Railroad forces the overflow toward Arcade Creek.

In the lower portions of Robla Creek, floodwaters combine with those of Dry Creek. For the 500-year flood event, some floodwaters will overtop a levee on the Magpie Creek Diversion and flow south. The flow rates on the Natomas East and West Drainage Canals are affected by large volumes of available overbank storage, rather small channel capacities, and the substantial capacities of discharge pumping plants. These features cause many fluctuations in the frequency-discharge, drainage area curves.

Available information on 100-year flow rates and tidal elevations in the area studied by approximate methods is tabulated below.

<u>Flow Stage</u> <u>Stream Location</u>	<u>(cfs)</u>	<u>(Feet)</u>
SAN JOAQUIN RIVER STREAM GROUP		
Beach Lake Pumping Plant No. 1	325	*
Beach Lake, South End Pumping Plant No. 2	455	*
North Stone Lake (Tributary) Pumping Plant No. 3	2,160	12.45
South Stone Lake (Tributary) Pumping Plant No. 4	3,400	12.45
South Stone Lake, South Tributary	3,850	12.45
Snodgrass Slough at Laurel Lane		15.40
Snodgrass Slough North of Lambert Road	12.50	*
Cosumnes River at Michigan Bar	61,000	*
Deer Creek near Sloughhouse	12,000	*
Deer Creek at Carson Creek School Dam	6,600	*
Laguna Creek at U.S. Highways 99-50	10,800	*
Dry Creek Near Galt	30,000	*

* No tidal information; being isolated from the tidal influence

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Flood elevations were computed through the use of the COE HEC-2 step-backwater computer program (Reference 17), supplemented by hand calculations where required.

Cross sections for backwater analyses were located at close intervals upstream and downstream from bridges and culverts and other hydraulically significant features in order to establish the backwater effects of such structures in areas that are urbanized or potentially subject to development. The cross sections were either field surveyed or taken from available construction plans.

USGS topographic maps, field inspection, and field measurements were used to supplement available data and to determine data on other streams (Reference 2).

Additional cross sections on the Mokelumne River were located at representative locations in the study area. Cross section data were derived from a 1972 USGS publication (Reference 18) supplemented with topographic maps.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

The roughness factors (Manning's "n") were assigned on the basis of field inspection of the floodplain areas. The values varied from 0.014 to 0.060 for the channel and from 0.040 to 0.100 for the overbank areas. For the Mokelumne River the values range from 0.04 to 0.10 for the channel and from 0.04 to 0.11 for overbank areas. These values range from 0.025 to 0.060 for channels and from 0.030 to 0.080 for overbank areas for streams in the Morrison Stream Group Basin.

Starting water-surface elevations were taken from the flood elevations of the streams to which they are tributary, developed by the slope-area method, or determined by hydrograph routing in conjunction with a computed area-elevation curve for those streams that flowed to a pump station outfall. Starting water-surface elevations in the Beach-Stone Lake area were available from a previous COE study (Reference 19). Starting water-surface elevations for Morrison Creek were developed from concurrent stage in the Beach Stone Lake Area.

Flood profile were drawn showing computed water-surface elevations to an accuracy of ± 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Higher-high stage-frequency profiles were developed for the Sacramento River, Georgiana Slough and other sloughs in the county by connecting a line between the higher-high stage data for each pertinent gage. It should be noted that a stage shown on the stage-frequency curve for one gage is valid only for that particular gage being analyzed. Synthetic higher-high stage profiles for the 50- and 100-year and larger events were developed for six main channel reaches within the Delta. The 50- and 100-year higher-high stage profiles were based on historical flood profiles and the higher-high stage-frequency curves. The extreme flow and extreme tide combinations were developed using the hydrodynamics model for the Delta area and historical flood profiles. The 10-year event was extrapolated from a curve developed from 50- and 100-year data.

Levee systems within the Delta area were evaluated to determine freeboard and levee stability in accordance with FEMA criteria. The levees with sufficient minimum freeboard of three feet were evaluated for the risk of levee failure during a 100-year flood event. Evaluations were made primarily on the basis of existing site conditions along with historical and geotechnical data. Site conditions were determined through aerial reconnaissance in 1984 and on-site inspections of each levee in 1985 and 1986. The levees were evaluated for a variety of criteria, including levee stability and maintenance, and certified as either stable or unstable.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed and existing dams, levees, and other flood-control structures previously described operate properly and do not fail.

All elevations are referenced to the NGVD of 1929. Elevation reference marks used in this study are shown on the maps; the description of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing floodplain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross

section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000, with contour intervals of 5, 10, and 20 feet (Reference 2). For Morrison Creek, topographic maps at a scale of 1:4,800 were also available for flood delineation.

In addition to topographic data, other information useful in making flood-area determinations was obtained from reports previously completed by the U.S. Army Corps of Engineers (References 11, 19, 20, and 21) and by Sacramento County (Reference 22).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, and AO); and the 500-year floodplain boundary corresponds to the boundary of areas at moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

Floodplain boundaries for streams studied by approximate methods were established according to the professional judgment of engineers familiar with the region, taking into account flood elevations estimated from available historical flood data, existing hydrologic and hydraulic analyses, correlations with similar stream basins studied in detail, and field observations.

The rivers and streams for which approximate 100-year floodplain boundaries were determined were in areas less likely to be subject to development than those rivers and streams analyzed by detailed methods. As a first step in the approximate study, available topographic maps were examined and a general reconnaissance field trip to the area was made. All available reports and publications that referred to flooding and flood studies in the subject area were then obtained and studied (References 4, 5, 19, 23, and 24). The various agencies that published these reports were contacted by the study contractor.

A more detailed field study was then conducted. Whenever definitive information was available, such as USGS Flood-Prone Area Maps (Reference 1) or COE, Sacramento District, Flood Plain Information reports (Reference 23), a field check was made to verify the overall accuracy of such information. During this field study, flood plain boundaries for streams having no published information were established by professional engineering judgment. Also, a number of people who had lived in the area for 25 or more years were interviewed about past floods. All data were correlated and combined to establish floodplains in the areas studied by approximate methods.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown.

Many areas in Sacramento County are subject to sheet flow; that is, broad, shallow, overland flooding generally less than 2 feet deep and characterized by unpredictable flow paths. The water-surface elevations of flooding in these areas are essentially independent of those along the adjacent streamway and are affected principally by natural and constructed barriers to the flow in the flood areas. Elevations in these areas were determined by engineering judgement and hand computations.

Major and minor levee systems affect floodplain boundaries at numerous locations in the study area. Also, many roadfills crossing floodplain areas alter the natural patterns of floodflows. These varying flow patterns can be seen on the maps in the form of confinement to streamways, ponding behind roadways, and lateral distribution of floodflows.

In accordance with FEMA criteria, a minimum earthen levee freeboard of 3 feet is required in evaluating the ability of levee systems to provide protection against the 100-year flood. If an earthen levee does not provide the specified 3-foot freeboard during a 100-year flood, it is assumed to fail. Therefore, the floodplains in the area of any such inadequate levee reflect flood conditions without a flood control structure in place.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are

tabulated at selected cross sections (Table 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 10.

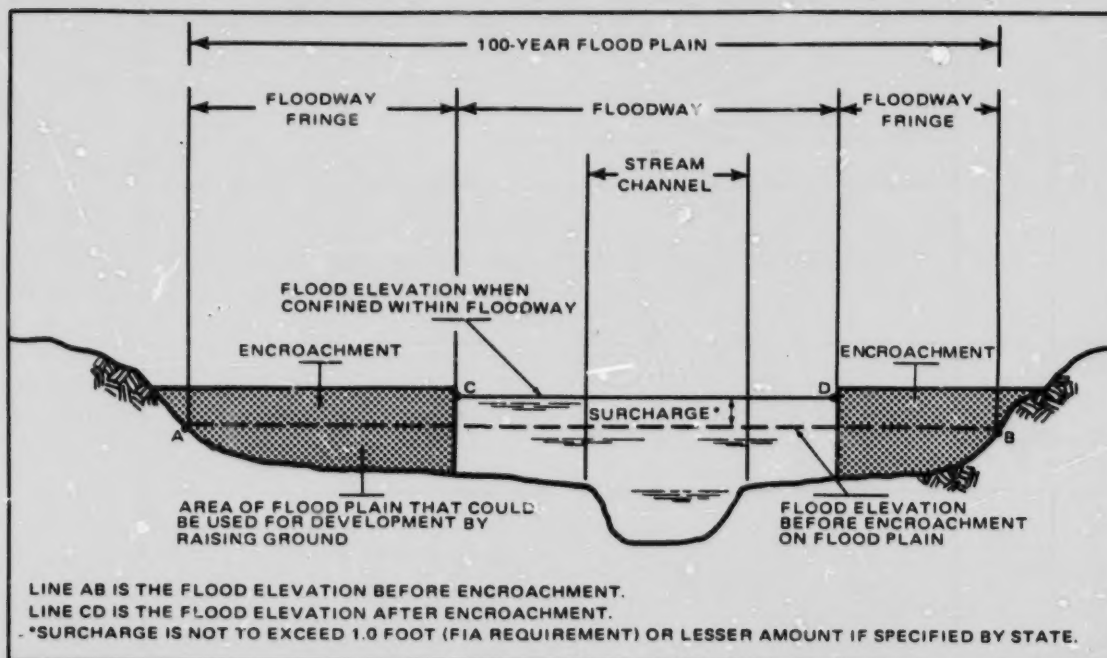


Figure 10. Floodway Schematic

Many unique conditions in the areas studied by detailed methods caused floodways to be determined by methods other than equal-conveyance reduction. The alternate methods and floodway data that deviate from normal interpretation are explained below.

The floodway for the Natomas North Drainage Canal was determined by a volumetric method. The pumped discharge to the Sacramento River causes excess floodwaters to be ponded until the pump, operating at peak rate, can remove them. The base flood elevation was determined by calculating the elevation required to store the excess volume of floodwater. The floodway elevation was set at 1.0 foot above the base flood elevation, while the areal extent of the flood plain pond was reduced so that storage loss in the floodway fringe was balanced by storage gain the floodway. This method of floodway determination thus permitted the necessary storage volume,

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
American River								
A	5.96	1,550 ²	22,100	5.2	37.9	37.9	37.9	0.0
B	8.73	1,250 ²	18,300	6.3	44.5	44.5	44.5	0.0
C	9.33	1,150 ²	13,900	8.3	45.7	45.7	45.7	0.0
D	10.00	950	15,000	7.7	48.0	48.0	48.0	0.0
E	10.19	850	15,700	7.3	48.2	48.2	48.2	0.0
F	10.56	1,300	28,100	4.1	49.1	49.1	49.1	0.0
G	10.91	1,750	38,300	3.0	49.8	49.8	49.8	0.0
H	11.24	1,700	24,000	4.8	50.6	50.6	50.6	0.0
I	11.64	1,450	20,200	5.7	51.4	51.4	51.4	0.0
J	12.25	1,720	16,400	7.0	53.3	53.3	53.3	0.0
K	12.70	2,750	20,600	5.6	54.6	54.6	54.6	0.0
L	12.90	3,200	38,300	3.0	55.4	55.4	55.4	0.0
M	13.00	4,000	31,900	3.6	55.7	55.7	55.7	0.0
N	13.26	3,300	31,100	3.7	56.7	56.7	56.7	0.0
O	13.65	2,200	20,000	5.7	58.8	58.8	58.8	0.0
P	14.35	2,000	8,000	14.4	61.4	61.4	61.4	0.0
Q	14.83	1,500	21,000	5.5	63.4	63.4	63.4	0.0
R	15.08	1,250	13,500	8.5	64.5	64.5	64.5	0.0
S	15.33	1,250	18,000	6.4	65.5	65.5	65.5	0.0
T	15.68	1,200	8,000	14.4	67.8	67.8	67.8	0.0
U	16.00	1,500	14,500	7.9	69.7	69.7	69.7	0.0
V	16.27	1,700	15,000	7.7	70.6	70.6	70.6	0.0
W	16.60	1,200	13,100	8.8	72.2	72.2	72.2	0.0
X	17.10	900	9,000	12.8	75.1	75.1	75.1	0.0
Y	17.43	500	9,500	12.1	77.0	77.0	77.0	0.0
Z	18.80	700	9,200	12.5	85.5	85.5	85.5	0.0

¹Miles Above Mouth

²This Width Extends Beyond Corporate Limits

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

AMERICAN RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
American River (Continued)								
AA	19.30	1,250	14,200	8.1	87.2	87.2	87.2	0.0
AB	19.60	1,350	19,000	6.1	87.8	87.8	87.8	0.0
AC	19.90	1,450	14,100	8.2	88.6	88.6	88.6	0.0
AD	20.08	1,150	14,500	7.9	90.1	90.1	90.1	0.0
AE	20.30	1,200	12,800	9.0	91.0	91.0	91.0	0.0
AF	20.50	1,100	11,100	10.4	91.9	91.9	91.9	0.0
AG	20.52	1,100	11,100	10.4	92.3	92.3	92.3	0.0
AH	20.88	900	16,200	7.1	93.5	93.5	93.5	0.0
AI	21.25	700	17,400	6.6	94.2	94.2	94.2	0.0
AJ	21.62	700	12,300	9.3	95.3	95.3	95.3	0.0
AK	21.93	600	12,300	9.3	96.5	96.5	96.5	0.0
AL	22.30	1,000	18,300	6.3	97.5	97.5	97.5	0.0
AM	22.60	450	9,200	12.5	99.0	99.0	99.0	0.0
AN	22.72	400	6,100	18.9	100.5	100.5	100.5	0.0
AO	22.86	350	7,100	16.2	103.6	103.6	103.6	0.0
AP	23.07	1,000	26,100	4.4	105.0	105.0	105.0	0.0
AQ	23.14	1,050	6,700	17.2	125.9	125.9	125.9	0.0
AR	23.15	1,050	35,500	3.2	126.0	126.0	126.0	0.0
AS	23.40	1,200	29,400	3.9	126.0	126.0	126.0	0.0
AT	23.60	1,200	28,700	4.0	126.0	126.0	126.0	0.0
AU	23.98	1,300	27,400	4.2	126.0	126.0	126.0	0.0
AV	24.42	950	23,000	5.0	126.0	126.0	126.0	0.0
AW	24.78	1,000	22,100	5.2	126.0	126.0	126.0	0.0
AX	25.13	450 ²	13,700	8.4	126.0	126.0	126.0	0.0
AY	25.58	850 ²	28,100	4.1	126.0	126.0	126.0	0.0

¹Miles Above Mouth

²This Width Extends Beyond Corporate Limits

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

AMERICAN RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
American River (Continued)								
AZ	26.07	750 ²	13,700	8.4	126.0	126.0	126.0	0.0
BA	26.40	800 ²	13,100	8.8	126.0	126.0	126.0	0.0
BB	26.72	450 ²	9,200	12.5	127.8	127.8	127.8	0.0
BC	26.88	820 ²	17,100	6.7	128.5	128.5	128.5	0.0
BD	27.82	400	5,700	20.2	137.3	137.3	137.3	0.0
BE	27.86	350	6,500	17.7	138.6	138.6	138.6	0.0
BF	28.39	250	5,600	20.5	146.6	146.6	146.6	0.0
BG	28.80	200	5,700	20.2	152.4	152.4	152.4	0.0
BH	29.18	180	5,700	20.2	156.8	156.8	156.8	0.0

¹Miles Above Mouth ²This Width Extends Beyond Corporate Limits

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

AMERICAN RIVER

BLANK PAGE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek								
A	5.35	100	1,020	4.9	62.0	62.0	63.0	1.0
B	6.66	130	1,190	4.0	71.0	71.0	72.0	1.0
C	6.88	140	2,040	3.8	72.1	72.1	73.1	1.0
D	7.00	150	1,030	4.6	72.8	72.8	73.6	0.8
E	7.17	130	1,010	4.7	74.2	74.2	74.9	0.7
F	7.28	100	910	5.2	74.7	74.7	75.7	1.0
G	7.39	150	1,290	3.7	76.2	76.2	77.0	0.8
H	7.56	130	1,090	4.3	77.4	77.4	78.3	0.9
I	7.68	140	880	5.3	78.1	78.1	79.1	1.0
J	7.85	120	980	4.8	79.6	79.6	80.6	1.0
K	8.02	90	820	5.8	80.7	80.7	81.7	1.0
L	8.13	60	720	6.5	81.8	81.8	82.8	1.0
M	8.42	110	970	4.0	84.6	84.6	85.6	1.0
N	8.53	100	870	4.5	85.3	85.3	86.4	0.9
O	8.70	110	920	4.3	87.0	87.0	88.0	1.0
P	8.81	90	780	5.1	87.7	87.7	88.6	0.9
Q	8.93	90	730	5.3	88.6	88.6	89.6	1.0
R	9.10	90	760	5.1	90.6	90.6	91.2	0.6
S	9.27	110	880	4.4	92.1	92.1	92.9	0.8
T	9.38	90	820	4.8	92.9	92.9	93.8	0.9
U	9.50	100	830	4.7	93.8	93.8	94.7	0.9
V	9.66	100	840	4.6	95.7	95.7	96.7	1.0
W	9.78	110	1,090	3.6	97.1	97.1	98.0	0.9
X	9.95	100	940	4.2	98.0	98.0	99.0	1.0
Y	10.12	110	940	4.2	98.9	98.9	99.9	1.0
Z	10.29	110	820	4.8	100.3	100.3	101.2	0.9

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek (Continued)								
AA	10.41	100	850	4.6	101.2	101.2	102.1	0.9
AB	10.69	180	1,050	3.7	103.2	103.2	103.9	0.7
AC	10.81	220	1,200	3.3	104.1	104.1	104.7	0.6
AD	10.92	180	1,230	3.2	106.4	106.4	106.9	0.5
AE	11.09	160	1,020	1.5	107.2	107.2	108.2	1.0
AF	11.33	140	630	2.4	107.7	107.7	108.6	0.8
AG	11.43	300	1,370	1.1	109.2	109.2	109.9	0.7
AH	11.54	300	1,210	1.2	109.4	109.4	110.4	1.0
AI	11.83	120	500	3.0	111.2	111.2	112.1	0.9
AJ	12.11	50	300	4.0	114.1	114.1	115.1	1.0
AK	12.22	60	440	3.4	115.8	115.8	116.6	0.8
AL	12.34	50	330	4.6	116.5	116.5	117.3	0.8
AM	12.45	100	580	3.8	117.4	117.4	118.3	0.9
AN	12.68	60	370	4.0	119.0	119.0	120.0	1.0
AO	12.85	70	470	3.2	121.3	121.3	122.1	0.8
AP	12.94	60	410	3.7	122.0	122.0	122.9	0.9
AQ	13.13	50	400	3.8	123.2	123.2	124.2	1.0
AR	13.53	70	450	3.6	126.6	126.6	127.6	1.0
AS	13.98	60	320	5.0	130.6	130.6	131.6	1.0
AT	14.21	60	380	4.2	133.1	133.1	134.1	1.0
AU	14.33	70	420	3.8	134.8	134.8	135.8	1.0
AV	14.50	60	410	4.0	136.2	136.2	137.2	1.0
AW	14.72	60	450	3.6	138.2	138.2	139.2	1.0
AX	14.89	60	370	4.3	140.8	140.8	141.6	0.8
AY	15.07	60	430	3.8	142.1	142.1	142.8	0.7

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		ARCADE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek (Continued)								
AZ	15.41	60	380	4.2	145.3	145.3	146.3	1.0
BA	15.52	60	460	3.5	147.5	147.5	148.3	0.8
BB	15.75	70	370	4.3	148.6	148.6	149.6	1.0
BC	15.86	50	290	5.7	150.5	150.5	151.1	0.6
BD	15.883	35	280	5.9	152.8	152.8	153.7	0.9
BE	15.899	185	1,040	1.6	153.0	153.0	154.0	1.0
BF	15.907	40	310	3.5	153.0	153.0	153.9	0.9
BG	15.917	40	310	3.5	153.2	153.2	154.1	0.9
BH	15.925	155	840	1.3	153.4	153.4	154.3	0.9
BI	15.964	410	1,800	0.6	153.4	153.4	154.3	0.9
BJ	15.990	410	2,450	0.4	153.4	153.4	154.4	1.0
BK	16.030	60	370	2.9	153.4	153.4	154.3	0.9
BL	16.068	65	410	2.6	153.5	153.5	154.4	0.9
BM	16.144	60	280	3.8	153.7	153.7	154.6	0.9
BN	16.258	75	290	3.7	154.4	154.4	155.4	1.0
BO	16.371	50	170	6.3	155.7	155.7	156.7	1.0
BP	16.485	60	210	5.1	158.6	158.6	159.5	0.9
BQ	16.564	55	180	6.0	160.3	160.3	161.3	1.0
BR	16.695	65	220	4.2	163.3	163.3	164.2	0.9
BS	16.725	85	370	2.5	164.3	164.3	165.3	1.0
BT	16.759	50	200	4.6	164.5	164.5	165.3	0.8
BU	16.788	25	100	9.2	164.7	164.7	165.5	0.8
BV	16.896	55	220	4.2	167.8	167.8	168.6	0.8
BW	16.977	70	280	3.3	168.5	168.5	169.4	0.9
BX	17.019	35	120	7.7	168.6	168.6	169.4	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek (Continued)								
BY	17.053	55	210	4.4	169.9	169.9	170.9	1.0
BZ	17.072	60	160	5.8	171.0	171.0	171.0	0.0
CA	17.093	80	120	7.7	171.4	171.4	171.6	0.2
CB	17.130	60	290	3.2	172.3	172.3	173.2	0.9
CC	17.205	35	140	6.6	172.8	172.8	173.4	0.6
CD	17.318	35	160	5.8	176.3	176.3	176.4	0.1
CE	17.356	35	140	6.6	176.8	176.8	177.3	0.5
CF	17.580	45	200	4.6	180.4	180.4	181.4	1.0
CG	17.697	40	170	5.4	182.2	182.2	183.0	0.8
CH	17.852	55	210	4.4	185.0	185.0	185.6	0.6
CI	17.959	60	160	5.8	186.8	186.8	187.3	0.5
CJ	17.976	70	250	3.7	187.3	187.3	187.9	0.6
CK	18.000	50	130	4.7	188.6	188.6	189.3	0.7
CL	18.021	55	240	1.7	191.0	191.0	191.0	0.0
CM	18.152	45	130	3.2	191.2	191.2	191.2	0.0
CN	18.189	35	90	4.7	191.4	191.4	191.4	0.0
CO	18.261	20	50	8.4	192.4	192.4	192.5	0.1
CP	18.421	45	130	3.2	196.2	196.2	196.7	0.5
CQ	18.473	25	70	5.4	196.9	196.9	197.3	0.4
CR	18.505	20	100	3.8	201.0	201.0	201.0	0.0
CS	18.645	30	90	4.2	201.7	201.7	202.1	0.4
CT	18.695	35	90	4.2	202.4	202.4	202.9	0.5
CU	18.757	25	60	6.3	204.0	204.0	204.7	0.7
CV	18.814	25	80	3.7	206.3	206.3	207.2	0.9
CW	18.829	20	50	5.9	208.2	208.2	209.0	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek (Continued)								
CX	18.847	40	190	1.5	209.5	209.5	210.3	0.8
CY	18.900	55	180	1.6	209.6	209.6	210.4	0.8
CZ	18.923	45	130	2.3	209.7	209.7	210.4	0.7
DA	18.947	25	50	5.9	209.9	209.9	210.5	0.6
DB	19.034	30	60	4.2	213.9	213.9	214.7	0.8
DC	19.061	35	160	1.6	215.8	215.8	216.5	0.7
DD	19.098	35	130	1.9	215.9	215.9	216.6	0.7
DE	19.144	20	70	3.6	216.0	216.0	216.7	0.7
DF	19.153	20	70	3.6	216.8	216.8	217.5	0.7
DG	19.159	20	70	3.6	216.8	216.8	217.6	0.8
DH	19.201	20	60	2.6	217.4	217.4	218.0	0.6

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek South Branch								
A	0.038	40	120	8.2	153.0	153.0	154.0	1.0
B	0.114	95	340	2.9	153.0	153.0	154.0	1.0
C	0.189	35	130	7.6	153.0	153.0	154.0	1.0
D	0.265	80	290	3.4	153.0	153.0	154.0	1.0
E	0.322	60	140	7.0	153.8	153.8	154.0	0.2
F	0.379	75	230	4.3	155.2	155.2	156.1	0.9
G	0.492	60	170	5.8	157.1	157.1	158.1	1.0
H	0.568	50	160	6.2	159.7	159.7	160.2	0.5
I	0.645	65	180	5.5	161.3	161.3	162.3	1.0
J	0.672	25	90	10.5	163.3	163.3	163.3	0.0
K	0.710	25	120	7.9	165.0	165.0	165.6	0.6
L	0.812	25	150	6.3	169.5	169.5	170.5	1.0
M	0.871	115	580	1.6	170.4	170.4	171.4	1.0
N	0.947	75	390	2.4	170.5	170.5	171.5	1.0
O	1.023	85	320	3.0	170.7	170.7	171.6	0.9
P	1.098	100	1,040	0.9	170.8	170.8	171.8	1.0
Q	1.136	95	550	1.7	171.0	171.0	172.0	1.0
R	1.174	25	90	10.5	174.7	174.7	174.7	0.0
S	1.212	45	190	5.0	174.9	174.9	175.8	0.9
T	1.250	65	250	3.8	175.5	175.5	176.4	0.9
U	1.323	50	160	5.9	176.4	176.4	177.2	0.8
V	1.420	75	240	3.9	178.7	178.7	179.4	0.7
W	1.441	85	410	2.3	180.1	180.1	181.1	1.0
X	1.477	85	370	2.6	180.2	180.2	181.2	1.0
Y	1.503	35	160	5.9	180.3	180.3	181.1	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK SOUTH BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek South Branch (Continued)								
Z	1.553	25	110	8.6	181.0	181.0	181.8	0.8
AA	1.616	50	220	4.0	182.9	182.9	183.8	0.9
AB	1.638	90	370	2.4	184.6	184.6	185.5	0.9
AC	1.705	55	230	3.8	184.6	184.6	185.5	0.9
AD	1.742	40	130	6.8	184.9	184.9	185.6	0.7
AE	1.818	50	120	7.3	188.1	188.1	188.5	0.4
AF	1.850	70	190	4.6	189.4	189.4	190.1	0.7
AG	1.855	55	220	4.0	189.4	189.4	190.4	1.0
AH	1.893	40	140	6.3	190.1	190.1	190.6	0.5
AI	1.942	35	140	6.3	191.0	191.0	191.5	0.5
AJ	1.955	30	120	7.3	191.0	191.0	191.8	0.8
AK	2.010	65	230	3.8	192.3	192.3	192.9	0.6
AL	2.029	50	190	4.6	192.5	192.5	193.1	0.6
AM	2.082	60	230	3.8	192.9	192.9	193.7	0.8
AN	2.140	35	110	8.0	193.3	193.3	194.0	0.7
AO	2.197	65	220	4.0	194.8	194.8	195.7	0.9
AP	2.265	35	110	7.3	195.8	195.8	196.4	0.6
AQ	2.294	65	230	3.5	198.7	198.7	198.7	0.0
AR	2.360	45	150	5.3	198.7	198.7	198.7	0.0
AS	2.420	50	150	5.3	199.2	199.2	199.6	0.4
AT	2.429	50	110	7.3	199.5	199.5	199.5	0.0
AU	2.488	85	190	4.2	200.3	200.3	200.4	0.1
AV	2.500	80	220	3.6	200.5	200.5	200.8	0.3
AW	2.538	125	210	3.8	201.4	201.4	202.4	1.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK SOUTH BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Arcade Creek South Branch (Continued)								
AX	2.643	60	140	5.7	203.6	203.6	203.9	0.3
AY	2.664	75	290	2.8	204.3	204.3	205.1	0.8
AZ	2.671	80	400	2.0	205.1	205.1	206.0	0.9
BA	2.727	40	100	8.0	205.9	205.9	206.9	1.0
BB	2.728	30	90	8.9	206.3	206.3	207.2	0.9
BC	2.853	15	50	10.4	209.5	209.5	209.5	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ARCADE CREEK SOUTH BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Brooktree Creek								
A	0.007	40	210	7.7	97.8	97.8	98.8	1.0
B	0.114	40	210	7.7	97.8	97.8	98.8	1.0
C	0.185	55	300	5.4	98.0	98.0	99.0	1.0
D	0.379	90	470	3.5	99.6	99.6	100.6	1.0
E	0.451	60	310	5.2	100.6	100.6	101.5	0.9
F	0.587	70	290	5.6	102.7	102.7	103.5	0.8
G	0.632	80	560	2.9	108.0	108.0	108.4	0.4
H	0.758	70	500	3.3	108.1	108.1	108.5	0.4
I	0.800	75	480	3.4	108.2	108.2	108.6	0.4
J	0.831	100	560	2.9	108.2	108.2	108.9	0.7
K	0.909	50	260	6.3	108.1	108.1	108.7	0.6
L	0.947	100	450	3.6	108.1	108.1	108.9	0.8
M	1.098	45	200	3.5	109.8	109.8	110.7	0.9
N	1.175	40	170	4.2	110.5	110.5	111.4	0.9
O	1.252	40	130	5.5	111.2	111.2	111.6	0.4
P	1.402	40	80	8.9	112.8	112.8	113.2	0.4
Q	1.459	85	520	1.4	114.1	114.1	114.9	0.8
R	1.486	75	220	3.2	116.8	116.8	117.8	1.0
S	1.591	30	100	7.1	116.8	116.8	116.8	0.0
T	1.704	30	85	8.0	118.4	118.4	118.4	0.0
U	1.800	30	70	9.0	120.5	120.5	120.5	0.0
V	1.838	25	80	7.9	122.1	122.1	122.1	0.0
W	1.932	25	120	5.2	122.4	122.4	122.4	0.0
X	2.083	35	130	4.8	124.2	124.2	124.5	0.3
Y	2.129	30	140	4.5	124.7	124.7	124.9	0.2
Z	2.232	30	80	7.9	127.7	127.7	127.7	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

BROOKTREE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Brooktree Creek (Continued)								
AA	2.386	30	90	7.0	130.2	130.2	130.6	0.4
AB	2.554	50	100	6.3	131.6	131.6	132.6	1.0
AC	2.574	40	160	3.8	133.2	133.2	134.1	0.9
AD	2.612	40	140	4.3	133.4	133.4	134.1	0.7
AE	2.687	45	130	4.6	134.8	134.8	135.0	0.2
AF	2.732	50	160	3.8	135.6	135.6	135.9	0.3
AG	2.784	50	100	6.0	135.9	135.9	136.8	0.9
AH	2.836	40	160	3.8	135.9	135.9	136.5	0.6
AI	2.919	20	80	7.5	137.5	137.5	138.5	1.0
AJ	2.986	20	80	7.5	140.3	140.3	140.2	0.1
AK	3.011	20	120	5.0	143.8	143.8	143.8	0.0
AL	3.105	20	80	7.2	143.8	143.8	143.8	0.0
AM	3.180	20	60	9.6	144.6	144.6	144.6	0.0
AN	3.259	20	60	9.6	147.1	147.1	147.1	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

BROOKTREE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Carmichael Creek								
A	0.811	35	100	10.6	72.5	72.5	72.6	0.1
B	0.922	55	270	3.9	76.3	76.3	76.6	0.3
C	0.953	25	160	6.6	77.6	77.6	77.7	0.1
D	1.083	25	170	6.2	79.0	79.0	79.7	0.7
E	1.162	80	380	2.7	79.9	79.9	80.8	0.9
F	1.197	85	450	2.3	86.0	86.0	86.1	0.1
G	1.311	95	710	1.5	86.1	86.1	86.3	0.2
H	1.452	50	390	2.6	86.1	86.1	86.3	0.2
I	1.483	55	410	2.5	87.3	87.3	87.6	0.3
J	1.607	55	400	2.4	87.5	87.5	87.8	0.3
K	1.765	65	350	2.8	87.7	87.7	88.1	0.4
L	1.955	30	150	6.5	88.3	88.3	88.8	0.5
M	2.106	50	200	4.5	90.3	90.3	91.3	1.0
N	2.261	25	110	8.1	92.3	92.3	92.9	0.6
O	2.371	40	160	5.4	95.5	95.5	96.5	1.0
P	2.411	40	180	4.8	96.3	96.3	97.3	1.0
Q	2.467	55	250	3.5	97.0	97.0	97.9	0.9
R	2.485	20	120	7.3	98.9	98.9	99.7	0.8
S	2.542	25	150	5.8	100.2	100.2	101.2	1.0
T	2.572	85	840	1.0	106.1	106.1	106.4	0.3
U	2.788	70	440	1.9	106.2	106.2	106.4	0.2
V	2.920	300	1,000	0.7	106.2	106.2	106.5	0.3

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CARMICHAEL CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Chicken Ranch Slough								
A	0.15	40	390	2.6	32.9	32.9	33.9	1.0
B	0.28	40	360	2.8	33.2	33.2	34.2	1.0
C	0.51	30	280	3.6	33.3	33.3	34.3	1.0
D	0.59	30	270	3.8	33.3	33.3	34.3	1.0
E	0.76	30	240	4.2	33.7	33.7	34.7	1.0
F	0.90	30	200	4.9	33.7	33.7	34.7	1.0
G	1.03	30	150	6.9	34.5	34.5	35.0	0.5
H	1.22	30	110	7.8	35.3	35.3	35.6	0.3
I	1.35	30	130	6.6	36.3	36.3	37.3	1.0
J	1.52	50	230	3.8	38.3	38.3	39.1	0.8
K	1.74	40	200	4.4	39.6	39.6	40.2	0.6
L	1.86	40	200	4.4	41.1	41.1	41.9	0.8
M	2.07	30	140	6.2	42.6	42.6	43.6	1.0
N	2.23	60	370	2.4	45.0	45.0	45.6	0.6
O	2.39	60	240	3.0	45.7	45.7	46.5	0.8
P	2.50	30	140	5.2	45.7	45.7	46.5	0.8
Q	2.65	50	160	4.6	47.4	47.4	47.9	0.5
R	2.80	40	170	4.4	49.3	49.3	49.9	0.6
S	2.92	30	170	4.6	49.9	49.9	50.5	0.6
T	3.07	40	180	4.3	50.3	50.3	50.9	0.6
U	3.26	40	200	3.7	51.7	51.7	52.4	0.7
V	3.48	40	210	3.5	53.6	53.6	54.6	1.0
W	3.67	40	210	3.3	55.0	55.0	56.0	1.0
X	3.70	40	160	4.6	55.9	55.9	56.9	1.0
Y	3.90	40	180	3.9	57.3	57.3	58.1	0.8
Z	4.09	40	180	4.0	57.7	57.7	58.5	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHICKEN RANCH SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Chicken Ranch Slough (Continued)								
AA	4.28	30	120	5.9	58.6	58.6	59.1	0.5
AB	4.39	40	160	4.6	59.4	59.4	60.0	0.6
AC	4.62	30	140	4.9	60.6	60.6	61.5	0.9
AD	4.77	30	160	4.3	61.8	61.8	62.8	1.0
AE	4.92	50	240	2.8	63.7	63.7	64.6	0.9
AF	5.00	30	180	3.7	65.1	65.1	65.8	0.7
AG	5.27	40	230	3.0	66.8	66.8	67.8	1.0
AH	5.38	30	150	4.5	67.6	67.6	68.4	0.8
AI	5.49	40	210	3.7	68.9	68.9	69.8	0.9
AJ	5.68	40	270	2.8	70.3	70.3	71.3	1.0
AK	5.80	40	180	4.3	72.0	72.0	72.7	0.7
AL	5.95	30	180	4.2	73.3	73.3	74.3	1.0
AM	6.13	30	170	4.5	73.6	73.6	74.6	1.0
AN	6.25	30	140	5.4	76.1	76.1	76.7	0.5
AO	6.48	40	200	4.1	78.5	78.5	79.3	0.8
AP	6.70	50	260	3.1	80.9	80.9	81.8	0.9
AQ	6.93	30	160	5.2	82.9	82.9	83.6	0.7
AR	7.08	40	260	3.2	84.6	84.6	85.5	0.9
AS	7.31	30	170	5.3	86.2	86.2	87.1	0.9
AT	7.54	50	270	3.3	88.1	88.1	89.1	1.0
AU	7.77	50	270	3.4	89.6	89.6	90.6	1.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHICKEN RANCH SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Coyle Creek								
A	0.038	70	270	3.6	110.6	110.6	111.6	1.0
B	0.076	30	120	8.1	111.0	111.0	111.6	0.6
C	0.125	35	170	5.7	112.9	112.9	113.6	0.7
D	0.189	30	130	7.5	114.0	114.0	114.5	0.5
E	0.226	25	130	7.5	115.2	115.2	115.4	0.2
F	0.256	20	150	6.5	116.7	116.7	117.0	0.3
G	0.303	35	210	4.4	117.1	117.1	117.3	0.2
H	0.341	20	110	6.4	117.1	117.1	117.3	0.1
I	0.378	20	80	11.5	117.2	117.2	117.2	0.0
J	0.417	20	80	11.5	117.7	117.7	117.7	0.0
K	0.455	20	80	11.5	118.4	118.4	118.4	0.0
L	0.495	20	80	11.5	119.3	119.3	119.3	0.0
M	0.567	30	140	6.6	121.1	121.1	121.1	0.0
N	0.644	20	80	11.5	121.0	121.0	121.0	0.0
O	0.682	15	70	13.1	121.9	121.9	121.9	0.0
P	0.720	35	150	6.1	123.8	123.8	124.2	0.4
Q	0.752	30	150	6.1	124.1	124.1	124.7	0.6
R	0.866	30	130	7.1	125.8	125.8	126.6	0.8
S	0.900	30	230	4.0	129.5	129.5	129.6	0.1
T	0.919	30	230	3.5	129.5	129.5	129.7	0.2
U	1.061	30	160	5.1	129.8	129.8	130.3	0.5
V	1.136	30	140	5.8	130.8	130.8	131.3	0.5
W	1.212	30	150	5.4	131.8	131.8	132.7	0.9
X	1.290	30	120	6.8	137.0	137.0	137.6	0.6
Y	1.314	30	210	3.5	137.8	137.8	137.8	0.0
Z	1.478	30	130	5.7	137.8	137.8	138.6	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

COYLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Coyle Creek (Continued)								
AA	1.667	30	110	6.7	142.8	142.8	142.8	0.0
AB	1.757	20	70	10.5	146.9	146.9	146.9	0.0
AC	1.823	20	80	9.2	150.8	150.8	150.8	0.0

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		COYLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Cripple Creek								
A	0.110	120	870	2.0	107.4	107.4	108.4	1.0
B	0.400	80	590	2.9	108.5	108.5	109.2	0.7
C	0.570	80	570	3.0	109.6	109.6	110.2	0.6
D	0.800	80	480	3.6	110.9	110.9	111.4	0.5
E	0.970	120	930	1.8	111.8	111.8	112.2	0.4
F	1.080	90	540	2.9	112.1	112.1	112.5	0.4
G	1.250	70	490	3.3	113.5	113.5	113.8	0.3
H	1.480	70	470	3.4	115.2	115.2	116.2	1.0
I	1.650	90	880	1.8	116.2	116.2	117.2	1.0
J	1.820	60	410	3.9	117.9	117.9	118.9	1.0
K	1.980	50	450	3.6	119.2	119.2	120.2	1.0
L	2.160	60	510	2.7	121.4	121.4	122.4	1.0
M	2.330	60	450	3.1	122.1	122.1	123.1	1.0
N	2.500	50	350	4.0	122.8	122.8	123.7	0.9
O	2.730	60	270	5.2	124.6	124.6	125.4	0.8
P	2.900	40	300	4.7	125.9	125.9	126.8	0.9
Q	3.070	50	350	4.0	127.0	127.0	128.0	1.0
R	3.240	30	150	9.3	128.2	128.2	128.7	0.5
S	3.350	40	300	4.7	131.4	131.4	131.9	0.5
T	3.540	60	490	2.9	132.5	132.5	133.1	0.6
U	3.750	50	340	4.1	134.2	134.2	135.1	0.9
V	3.980	30	300	4.0	135.8	135.8	136.8	1.0
W	4.090	60	330	3.7	136.7	136.7	137.5	0.8
X	4.200	50	300	4.0	137.6	137.6	138.5	0.9
Y	4.320	50	290	4.1	139.0	139.0	139.8	0.8
Z	4.490	50	350	3.4	140.6	140.6	141.6	1.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CRIPPLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Cripple Creek (Continued)								
AA	4.630	40	280	4.3	141.9	141.9	142.9	1.0
AB	4.770	50	300	4.0	144.2	144.2	144.8	0.6
AC	5.000	50	320	3.0	146.0	146.0	146.9	0.9
AD	5.230	30	230	4.1	148.2	148.2	149.2	1.0
AE	5.380	40	210	4.5	149.7	149.7	150.5	0.8
AF	5.510	60	380	2.5	150.9	150.9	151.9	1.0
AG	5.680	40	270	3.5	152.9	152.9	153.6	0.7
AH	5.709	50	260	2.7	153.9	153.9	154.3	0.4
AI	5.795	50	290	2.4	154.1	154.1	154.4	0.3
AJ	5.871	50	280	2.5	154.2	154.2	154.6	0.4
AK	5.881	50	350	2.0	154.4	154.4	154.7	0.3
AL	6.023	40	190	3.7	154.4	154.4	154.8	0.4
AM	6.136	35	180	3.9	154.8	154.8	155.4	0.6
AN	6.198	30	130	5.4	155.2	155.2	155.7	0.5
AO	6.283	30	110	6.3	157.0	157.0	157.2	0.2
AP	6.297	35	110	6.3	157.2	157.2	157.4	0.2
AO	6.364	55	210	3.3	158.1	158.1	158.6	0.5
AR	6.420	30	90	7.8	158.1	158.1	158.7	0.6
AS	6.498	45	160	4.4	160.1	160.1	160.9	0.8
AT	6.515	65	300	2.3	162.9	162.9	163.7	0.8
AU	6.650	75	390	1.8	163.1	163.1	163.9	0.8
AV	6.759	75	220	3.2	163.2	163.2	164.1	0.9
AW	6.818	80	280	2.5	163.6	163.6	164.5	0.9
AX	6.875	70	220	3.2	163.8	163.8	164.7	0.9
AY	6.932	45	110	6.3	164.5	164.5	165.1	0.6

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		CRIPPLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Cripple Creek (Continued)								
AZ	7.045	70	250	2.8	166.1	166.1	166.8	0.7
BA	7.159	60	170	4.1	166.8	166.8	167.6	0.8
BB	7.269	70	190	3.7	168.3	168.3	169.0	0.7
BC	7.386	85	180	3.9	169.8	169.8	170.3	0.5
BD	7.500	60	230	3.0	170.8	170.8	171.7	0.9
BE	7.595	60	200	3.5	171.6	171.6	172.3	0.7
BF	7.670	55	150	4.7	172.1	172.1	173.0	0.9
BG	7.699	70	210	3.3	172.6	172.6	173.5	0.9
BH	7.727	40	130	5.4	172.8	172.8	173.6	0.8
BI	7.784	50	160	4.4	174.1	174.1	174.8	0.7
BJ	7.927	25	120	5.0	175.9	175.9	176.6	0.7
BK	7.944	45	80	7.5	176.9	176.9	176.9	0.0
BL	8.068	50	190	3.2	178.6	178.6	179.3	0.7
BM	8.163	60	170	3.4	179.0	179.0	180.0	1.0
BN	8.176	45	200	2.9	180.6	180.6	181.4	0.8
BO	8.239	45	180	3.2	180.9	180.9	181.7	0.8
BP	8.352	35	130	4.4	181.8	181.8	182.6	0.8
BQ	8.371	60	270	2.1	184.0	184.0	184.6	0.6
BR	8.466	35	130	4.4	184.2	184.2	184.9	0.7
BS	8.525	40	150	3.8	184.8	184.8	185.6	0.8
BT	8.636	50	150	3.8	186.0	186.0	186.9	0.9
BU	8.691	40	140	4.1	186.9	186.9	187.7	0.8
BV	8.750	55	180	3.2	187.7	187.7	188.5	0.8
BW	8.864	45	130	4.4	188.7	188.7	189.7	1.0
BX	8.977	60	220	2.6	190.3	190.3	191.1	0.8

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		CRIPPLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Cripple Creek (Continued)								
BY	9.088	55	160	3.6	191.1	191.1	191.9	0.8
BZ	9.205	60	170	3.4	192.6	192.6	193.3	0.7
CA	9.318	35	100	5.8	194.6	194.6	195.2	0.6
CB	9.432	40	140	3.5	196.9	196.9	197.7	0.8
CC	9.447	65	320	1.5	199.8	199.8	200.6	0.8
CD	9.564	110	480	1.0	199.9	199.9	200.7	0.8
CE	9.659	75	240	2.1	200.0	200.0	200.8	0.8
CF	9.780	50	150	2.8	200.6	200.6	201.4	0.8
CG	9.788	45	140	3.0	201.4	201.4	202.1	0.7
CH	9.886	40	110	3.8	202.2	202.2	203.1	0.9
CI	10.030	30	100	3.9	204.8	204.8	205.6	0.8
CJ	10.039	35	120	3.3	205.1	205.1	205.9	0.8
CK	10.101	35	100	3.9	205.6	205.6	206.6	1.0
CL	10.164	25	80	4.9	206.8	206.8	207.6	0.8
CM	10.259	25	80	4.9	208.8	208.8	209.5	0.7
CN	10.353	30	100	3.9	210.3	210.3	211.2	0.9
CO	10.448	25	80	4.9	211.9	211.9	212.9	1.0
CP	10.543	25	90	4.4	213.8	213.8	214.8	1.0
CQ	10.634	25	80	4.9	215.6	215.6	216.5	0.9
CR	10.729	25	90	4.4	217.5	217.5	218.3	0.8
CS	10.805	25	70	1.9	218.5	218.5	219.3	0.8

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		CRIPPLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Dry Creek								
K	3.365	1,580 ²	N/A	3.0	51.5	51.5	51.5	0.0
L	3.700	1,300 ²	N/A	3.7	53.1	53.1	53.1	0.0
M	4.095	1,200 ²	N/A	7.6	55.3	55.3	55.3	0.0
N	4.355	1,300 ²	N/A	6.2	59.3	59.3	59.3	0.0
O	4.690	1,100 ²	N/A	5.1	62.4	62.4	62.4	0.0
P	5.020	800 ²	N/A	4.5	64.2	64.2	64.2	0.0
Q	5.140	190	N/A	4.8 ³	64.4	64.4	64.4	0.0
R	5.430	1,340 ²	N/A	5.1 ³	66.5	66.5	66.5	0.0
S	5.850	730 ²	N/A	2.9 ³	68.8	68.8	68.8	0.0
T	5.920	850 ²	2,160	4.7	69.2	69.2	69.2	0.0
U	5.950	250/500 ⁴	3,560	2.8	69.9	69.9	69.9	0.0
V	6.185	780	2,260	4.5	71.0	71.0	71.0	0.0
W	6.420	100/600 ⁴	1,320	7.7	74.3	74.3	74.3	0.0
X	6.660	700	2,530	4.0	78.5	78.5	78.5	0.0
Y	6.930	1,100	5,130	1.9	79.8	79.8	79.8	0.0
Dry Creek (North Branch)								
K	2.160	1,580 ²	N/A	5.2	51.7	51.7	51.7	0.0
L	2.435	1,300 ²	N/A	4.2	54.2	54.2	54.2	0.0
M	2.800	1,200 ²	N/A	3.6	57.7	57.7	57.7	0.0
N	3.120	1,300 ²	N/A	5.0	60.2	60.2	60.2	0.0
O	3.430	1,100 ²	N/A	4.0	62.4	62.4	62.4	0.0
P	3.725	800 ²	N/A	3.8	64.2	64.2	64.2	0.0
Q	3.850	350	N/A	3.8	64.9	64.9	64.9	0.0
R	4.140	1,340 ²	N/A	3.8	66.7	66.7	66.7	0.0
S	4.510	730 ²	N/A	5.6	68.7	68.7	68.7	0.0

¹Miles Above Mouth ²Floodway Includes Both North and Main Branches

³Channel Velocity

⁴Left and Right Channel

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY CREEK - DRY CREEK (NORTH BRANCH)

BLANK PAGE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH ² (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Dry Creek (Near Galt)								
A	29,866	777/627	8,868	4.1	35.6	35.6	36.6	1.0
B	30,938	1,260/ 1,050	14,928	2.5	36.1	36.1	37.1	1.0
C	31,958	1,144/ 344	13,457	2.7	36.3	36.3	37.3	1.0
D	32,896	892/482	10,254	3.6	36.7	36.7	37.7	1.0
E	34,125	891/811	10,590	3.5	37.3	37.3	38.3	1.0
F	35,499	792/592	8,365	4.4	38.0	38.0	39.0	1.0
G	36,670	1,118/ 1,118	11,288	3.3	38.8	38.8	39.8	1.0
H	37,352	869/769	9,539	3.8	39.1	39.1	40.1	1.0
I	38,007	690/590	8,301	4.4	39.4	39.4	40.4	1.0
J	38,026	690/510	8,882	4.1	40.3	40.3	41.2	0.9
K	38,703	1,194/ 264	12,147	3.0	40.7	40.7	41.6	0.9
L	39,466	968/313	9,531	3.9	41.0	41.0	41.8	0.8
M	39,853	759/459	7,112	5.2	41.1	41.1	42.0	0.9
N	39,895	761/456	7,347	5.0	41.4	41.4	42.3	0.9
O	40,768	1,152/ 317	12,143	3.0	42.3	42.3	43.0	0.7
P	41,566	1,322/ 202	11,967	3.1	42.7	42.7	43.5	0.8
Q	42,553	1,042/ 112	8,887	4.1	43.3	43.3	44.1	0.8
R	43,162	749/0	7,541	4.9	43.6	43.6	44.4	0.8

¹Feet Above Mouth

²Width/Width Within County Limits

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		DRY CREEK (NEAR GALT)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH ² (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Dry Creek (Near Galt) (Continued)								
S	45,077	1,037/ 700	7,641	4.8	46.0	46.0	47.0	1.0
T	45,971	996/526	8,449	4.3	47.1	47.1	48.1	1.0

¹Feet Above Mouth

²Width/Width Within County Limits

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY CREEK (NEAR GALT)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Dry Creek								
K	3.365	1,580 ²	N/A	3.0	51.5	51.5	51.5	0.0
L	3.700	1,300 ²	N/A	3.7	53.1	53.1	53.1	0.0
M	4.095	1,200 ²	N/A	7.6	55.3	55.3	55.3	0.0
N	4.355	1,300 ²	N/A	6.2	59.3	59.3	59.3	0.0
O	4.690	1,100 ²	N/A	5.1	62.4	62.4	62.4	0.0
P	5.020	800 ²	N/A	4.5	64.2	64.2	64.2	0.0
Q	5.140	190	N/A	4.8 ³	64.4	64.4	64.4	0.0
R	5.430	1,340 ²	N/A	5.1 ³	66.5	66.5	66.5	0.0
S	5.850	730 ²	N/A	2.9 ³	68.8	68.8	68.8	0.0
T	5.920	850 ²	2,160	4.7	69.2	69.2	69.2	0.0
U	5.950	250/500 ⁴	3,560	2.8	69.9	69.9	69.9	0.0
V	6.185	780	2,260	4.5	71.0	71.0	71.0	0.0
W	6.420	100/600 ⁴	1,320	7.7	74.3	74.3	74.3	0.0
X	6.660	700	2,530	4.0	78.5	78.5	78.5	0.0
Y	6.930	1,100	5,130	1.9	79.8	79.8	79.8	0.0
Dry Creek (North Branch)								
K	2.160	1,580 ²	N/A	5.2	51.7	51.7	51.7	0.0
L	2.435	1,300 ²	N/A	4.2	54.2	54.2	54.2	0.0
M	2.800	1,200 ²	N/A	3.6	57.7	57.7	57.7	0.0
N	3.120	1,300 ²	N/A	5.0	60.2	60.2	60.2	0.0
O	3.430	1,100 ²	N/A	4.0	62.4	62.4	62.4	0.0
P	3.725	800 ²	N/A	3.8	64.2	64.2	64.2	0.0
Q	3.850	350	N/A	3.8	64.9	64.9	64.9	0.0
R	4.140	1,340 ²	N/A	3.8	66.7	66.7	66.7	0.0
S	4.510	730 ²	N/A	5.6	68.7	68.7	68.7	0.0

¹Miles Above Mouth

²Floodway Includes Both North and Main Branches

³Channel Velocity

⁴Left and Right Channel

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY CREEK - DRY CREEK (NORTH BRANCH)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Elder Creek								
A	1.921	67	560	3.5	22.82	22.4	22.7	0.3
B	2.092	63	389	5.0	23.52	23.2	23.5	0.3
C	2.219	64	417	4.6	24.62	24.4	24.5	0.1
D	2.408	73	509	3.8	26.02	25.9	26.7	0.8
E	2.603	63	550	3.5	27.02	26.9	27.4	0.5
F	2.794	74	586	3.3	28.1	28.1	28.6	0.5
G	2.944	70	496	3.9	28.7	28.7	29.1	0.4
H	3.141	65	489	4.0	29.7	29.7	30.6	0.9
I	3.366	69	618	3.1	30.82	30.7	31.4	0.7
J	3.535	80	640	3.0	31.5	31.5	32.2	0.7
K	3.707	71	599	3.2	32.0	32.0	32.6	0.6
L	3.808	68	577	3.4	32.4	32.4	32.9	0.5
M	3.855	64	382	5.1	32.7	32.7	33.2	0.5
N	4.060	96	428	4.5	35.4	35.4	35.5	0.1
O	4.221	96	470	4.1	38.0	38.0	38.5	0.5
P	4.391	85	714	2.7	38.4	38.4	39.1	0.7
Q	4.558	140	693	2.8	38.9	38.9	39.5	0.6
R	4.794	87	667	2.9	39.8	39.8	40.2	0.4
S	5.016	150	565	3.4	40.5	40.5	41.1	0.6
T	5.217	179	591	3.3	41.8	41.8	42.7	0.9
U	5.374	292	796	2.4	43.9	43.9	44.5	0.6
V	5.586	300	1,742	1.1	45.8	45.8	46.5	0.7
W	5.777	327	1,242	1.5	46.0	46.0	46.8	0.8
X	5.935	319	1,175	0.9	46.2	46.2	47.0	0.8
Y	6.056	216	765	1.5	46.4	46.4	47.3	0.9
Z	6.274	215	503	2.2	47.2	47.2	48.1	0.9

¹Stream Distance in Miles Above Mouth

²Water-Surface Elevation Computed for the Case When Levee Overtopping Begins

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		ELDER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Elder Creek (cont.)								
AA	6.463	500	1,192	0.9	48.0	48.0	48.9	0.9
AB	6.660	154	356	3.0	48.9	48.9	49.6	0.7
AC	6.785	184	471	2.3	50.0	50.0	50.9	0.9
AD	6.904	193	573	1.9	50.9	50.9	51.7	0.8
AE	7.093	280	858	1.3	51.7	51.7	52.7	1.0
AF	7.226	350	888	1.2	52.0	52.0	53.0	1.0
AG	7.449	300	815	1.3	52.7	52.7	53.6	0.9
AH	7.654	400	970	1.1	53.2	53.2	54.2	1.0
AI	7.851	62	167	6.6	54.2	54.2	55.0	0.8
AJ	8.103	250	749	1.2	56.3	56.3	57.3	1.0
AK	8.320	200	521	1.7	56.9	56.9	57.8	0.9
AL	8.598	175	570	1.7	58.0	58.0	59.0	1.0
AM	8.769	116	404	2.2	58.9	58.9	59.8	0.9
AN	8.934	56	265	3.4	60.0	60.0	60.9	0.9
AO	9.178	53	259	3.7	62.2	62.2	62.4	0.2
AP	9.404	166	383	2.5	64.1	64.1	64.4	0.3
AQ	9.449	224	334	2.9	64.4	64.4	65.1	0.7
AR	9.678	150	426	2.3	67.3 ²	67.0	67.9	0.9
AS	9.908	175	505	1.9	68.6	68.6	69.4	0.8
AT	10.091	113	310	3.1	70.1	70.1	71.0	0.9
AU	10.306	110	326	2.9	72.9	72.9	73.9	1.0
AV	10.493	70	266	3.6	75.2	75.2	76.2	1.0
AW	10.690	184	1,030	0.8	80.7	80.7	81.7	1.0
AX	10.868	189	946	0.9	80.8	80.8	81.8	1.0
AY	11.046	199	660	1.2	81.0	81.0	82.0	1.0

¹Stream Distance in Miles Above Mouth

²Water-Surface Elevation Computed for the Case When Levee Overtopping Begins

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ELDER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Elder Creek (cont.)								
AZ	11.177	31	107	7.6	81.4	81.4	82.1	0.7
BA	11.309	175	595	1.4	82.9	82.9	83.9	1.0
BB	11.419	76	240	3.4	83.6	83.6	84.4	0.8
BC	11.588	100	352	2.3	85.3	85.3	86.3	1.0
BD	11.773	63	206	3.9	87.1	87.1	88.0	0.9
BE	11.957	150	661	1.2	91.6	91.6	91.7	0.1
BF	12.205	123	177	4.6	91.9	91.9	92.3	0.4

¹Stream Distance in Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		ELDER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Elk Grove Creek								
A	0.477	432	1,323	0.8	27.2	27.1	28.1	1.0
B	0.648	74	214	5.0	27.2	27.2	28.2	1.0
C	0.875	98	358	3.0	30.2	30.2	30.5	0.3
D	1.015	96	328	3.2	30.7	30.7	31.2	0.5
E	1.250	179	577	1.8	31.1	31.1	31.8	0.7
F	1.436	104	391	2.7	31.6	31.6	32.6	1.0
G	1.697	172	596	1.7	32.1	32.1	33.1	1.0
H	1.841	208	924	1.1	32.2	32.2	33.2	1.0
I	2.053	191	779	1.3	32.4	32.4	33.4	1.0
J	2.239	105	321	3.1	32.8	32.8	33.6	0.8
K	2.434	72	309	2.6	35.8	35.8	35.9	0.1
L	2.653	69	315	3.0	36.4	36.4	36.5	0.1
M	2.827	154	621	1.5	36.9	36.9	37.8	0.9
N	3.005	78	373	2.5	37.1	37.1	38.1	1.0
O	3.188	59	331	2.8	37.7	37.7	38.6	0.9
P	3.416	79	398	1.9	38.2	38.2	38.9	0.7
Q	3.575	81	432	1.8	38.4	38.4	39.1	0.7
R	3.760	68	344	2.3	38.5	38.5	39.1	0.6
S	3.958	57	286	2.7	39.4	39.4	39.7	0.3
T	4.147	71	336	2.3	40.0	40.0	40.2	0.2
U	4.261	70	366	1.3	40.2	40.2	40.4	0.2
V	4.383	70	314	1.5	40.2	40.2	40.4	0.2
W	4.458	58	239	2.0	40.3	40.3	40.5	0.2
X	4.595	55	209	2.3	40.5	40.5	40.7	0.2
Y	4.822	47	171	2.8	40.9	40.9	41.0	0.1
Z	4.900	46	280	1.7	46.2	46.2	46.2	0.0

¹Stream Distance in Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ELK GROVE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Elk Grove Creek (cont.)								
AA	5.097	38	232	1.7	46.3	46.3	46.3	0.0
AB	5.229	38	197	2.1	46.3	46.3	46.4	0.1
AC	5.422	27	51	7.9	47.2	47.2	48.2	1.0

¹Stream Distance in Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ELK GROVE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Florin Creek								
A	0.992	144/44 ²	357	3.0	20.3 ³	19.5	19.8	0.3
B	1.185	57	332	3.2	21.1 ³	20.5	20.9	0.4
C	1.393	48	264	4.0	22.5 ³	22.3	22.9	0.6
D	1.584	234	818	1.3	23.0 ³	22.9	23.9	1.0
E	1.770	99	329	3.3	23.3 ³	23.2	24.2	1.0
F	2.015	20	181	6.0	25.7 ³	25.6	26.5	0.9
G	2.076	216	973	1.1	26.9	26.9	27.7	0.8
H	2.248	138	421	2.6	27.0	27.0	27.8	0.8
I	2.449	46	342	3.2	27.7	27.7	28.5	0.8
J	2.632	48	358	3.1	28.2	28.2	29.0	0.8
K	2.805	100	427	2.6	29.6 ³	29.5	30.2	0.7
L	3.002	126	551	2.0	29.9 ³	29.8	30.8	1.0
M	3.163	42	344	3.2	31.7 ³	31.6	32.5	0.9
N	3.409	40	315	3.5	32.4	32.4	33.3	0.9
O	3.625	31	236	2.8	33.1 ³	33.0	34.0	1.0
P	3.850	43	294	2.2	33.8 ³	33.7	34.7	1.0
Q	4.038	23	170	3.8	35.3	35.3	35.9	0.6
R	4.113	75	347	1.9	35.8	35.8	36.3	0.5
S	4.202	42	275	1.5	36.1	36.1	36.6	0.5
T	4.395	33/17 ²	192	1.1	36.3	36.3	36.9	0.6

¹Stream Distance in Miles Above Mouth ³Water-Surface Elevations Computed for the Case When Levee Overtopping Begins

²Total Width/Width Within Corporate Limits

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		FLORIN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Laguna Creek ²								
AC	13.450	430	1,719	1.5	64.9	64.9	65.2	0.3
AD	13.654	398	1,593	1.6	65.0	65.0	65.8	0.8
AE	13.833	120	655	3.9	66.1	66.1	67.1	1.0
AF	13.897	55	438	5.9	66.9	66.9	67.9	1.0
AG	14.008	235	1,342	1.9	68.2	68.2	69.2	1.0
AH	14.221	211	925	2.8	69.4	69.4	70.2	0.8
AI	14.402	103	655	3.9	71.2	71.2	72.2	1.0
AJ	14.618	368	1,359	1.9	73.1	73.1	74.1	1.0
AK	14.823	95	425	6.1	75.7	75.7	76.5	0.8
AL	15.023	172	776	3.3	79.4	79.4	80.3	0.9
AM	15.216	92	578	4.5	81.0	81.0	82.0	1.0

¹Stream distance in miles above mouth

²No floodway is computed for the reach downstream of cross section AC

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

LAGUNA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Laguna Tributary Number 1								
A	0.144	239	509	1.9	49.6	48.1 ²	49.12	1.0
B	0.295	57	187	5.1	49.7	49.1 ²	50.12	1.0
C	0.460	70	273	3.5	50.8	50.8	51.8	1.0
D	0.676	60	257	3.3	51.9	51.9	52.9	1.0
E	0.863	53	245	3.5	52.8	52.8	53.8	1.0
F	1.084	140	613	1.4	54.7	54.7	55.5	0.8
G	1.156	129	592	1.3	54.8	54.8	55.6	0.8
H	1.261	84	314	2.4	54.9	54.9	55.7	0.8
I	1.443	174	405	1.9	55.3	55.3	56.2	0.9
J	1.650	107	272	2.8	55.9	55.9	56.9	1.0
K	1.783	74	212	3.6	57.0	57.0	58.0	1.0
L	1.970	430	1,366	0.5	59.1	59.1	60.0	0.9
M	2.177	201	679	1.0	59.2	59.2	60.1	0.9
N	2.335	148	424	1.6	59.3	59.3	60.2	0.9
O	2.543	99	246	2.7	59.8	59.8	60.8	1.0
P	2.688	98	243	2.7	60.7	60.7	61.7	1.0
Q	2.838	135	477	1.4	61.7	61.7	62.6	0.9
R	2.916	208	526	1.0	62.0	62.0	62.8	0.8
S	3.122	67	228	2.3	62.9	62.9	63.3	0.4
T	3.310	107	294	1.8	63.5	63.5	64.3	0.8
U	3.484	37	84	4.5	64.8	64.8	65.5	0.7
V	3.669	111	253	1.5	66.9	66.9	67.5	0.6

¹Stream Distance in Miles Above Mouth

²Elevation Computed Without Consideration of Backwater Effects From Laguna Creek

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		LAGUNA TRIBUTARY NUMBER 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Linda Creek								
A	2.959	100	510	3.3	169.2	169.2	170.2	1.0
B	3.136	125	560	3.0	170.2	170.2	171.2	1.0
C	3.271	95	400	4.2	171.3	171.3	172.2	0.9
D	3.470	70	350	4.9	173.6	173.6	174.6	1.0
E	3.633	115	400	4.0	176.6	176.6	177.3	0.7
F	3.785	70	300	5.3	179.4	179.4	179.8	0.4
G	3.917	100	300	5.3	181.6	181.6	182.6	1.0
H	4.102	70	320	5.0	185.6	185.6	186.4	0.8
I	4.273	120	440	3.4	187.2	187.2	188.1	0.9
J	4.442	80	190	7.9	189.6	189.6	189.6	0.0
K	4.626	115	460	3.3	193.1	193.1	193.4	0.3
L	4.694	90	350	4.3	193.5	193.5	193.7	0.2
M	4.719	120	430	2.6	195.4	195.4	195.6	0.2
N	4.895	40	210	5.0	197.2	197.2	197.9	0.7
O	5.061	70	240	4.3	201.3	201.3	202.0	0.7
P	5.251	40	180	5.4	204.5	204.5	205.4	0.9
Q	5.364	40	200	4.9	206.5	206.5	207.5	1.0
R	5.522	70	210	4.7	209.4	209.4	210.3	0.9
S	5.667	60	150	6.5	212.5	212.5	212.8	0.3
T	5.897	100	230	4.0	216.5	216.5	216.9	0.4
U	5.991	110	190	4.8	218.8	218.8	219.5	0.7
V	6.012	140	320	2.9	219.5	219.5	220.2	0.7
W	6.141	140	110	8.4	222.8	222.8	222.8	0.0
X	6.166	200	760	1.2	224.8	224.8	225.3	0.5
Y	6.292	75	130	7.1	227.8	227.8	227.8	0.0
Z	6.317	110	250	3.7	230.9	230.9	230.9	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

LINDA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Linda Creek (Continued)								
AA	6.493	40	140	6.1	235.0	235.0	235.7	0.7
AB	6.654	45	150	5.7	240.9	240.9	241.5	0.6
AC	6.834	45	110	7.8	251.3	251.3	251.4	0.1
AD	6.986	45	170	5.1	259.6	259.6	260.1	0.5
AE	7.080	30	130	5.5	262.3	262.3	262.9	0.6
AF	7.156	30	130	5.5	264.9	264.9	265.3	0.4

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

LINDA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Magpie Creek								
A	0.827	30	170	6.5	56.0	56.0	56.6	0.6
B	1.065	30	120	9.2	57.0	57.0	58.0	1.0
C	1.089	30	140	6.4	59.2	59.2	59.7	0.5
D	1.328	30	160	3.8	60.5	60.5	61.4	0.9
E	1.373	30	150	4.7	61.0	61.0	61.8	0.8
F	1.478	30	180	3.9	61.2	61.2	62.0	0.8
G	1.558	50	260	2.7	61.2	61.2	62.1	0.9
H	1.609	50	300	2.3	62.7	62.7	63.4	0.7
I	1.818	30	180	3.1	62.8	62.8	63.7	0.9
J	2.166	30	130	2.5	68.0	68.0	68.9	0.9
K	2.308	30	110	3.0	68.2	68.2	69.0	0.8
L	2.364	30	160	3.1	69.6	69.6	70.6	1.0
M	2.464	20	130	3.8	70.2	70.2	71.2	1.0
N	2.622	30	110	4.5	70.9	70.9	71.8	0.9
O	2.652	30	110	4.5	71.3	71.3	72.1	0.8
P	2.670	20	120	4.2	72.1	72.1	72.9	0.8
Q	2.687	20	120	4.2	73.0	73.0	74.0	1.0
R	2.740	30	150	6.3	74.8	74.8	75.6	0.8
S	2.792	120	350	2.9	75.8	75.8	76.8	1.0
T	2.830	150	370	2.7	76.1	76.1	77.1	1.0
U	2.896	115	270	3.7	76.8	76.8	77.8	1.0
V	3.015	80	420	2.3	80.2	80.2	80.2	0.0
W	3.265	30	210	3.7	80.5	80.5	80.7	0.2
X	3.428	30	180	4.3	80.5	80.5	80.8	0.3
Y	3.551	30	140	5.5	82.2	82.2	82.9	0.7
Z	3.775	30	140	5.5	85.5	85.5	86.1	0.6

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MAGPIE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Magpie Creek (Continued)								
AA	3.980	30	120	4.8	88.5	88.5	89.0	0.5
AB	4.155	25	110	5.2	91.5	91.5	91.5	0.0
AC	4.299	15	80	7.2	93.5	93.5	93.5	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MAGPIE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Mariposa Creek								
A	0.057	40	120	5.4	137.1	137.1	138.0	0.9
B	0.189	60	160	4.0	138.3	138.3	139.3	1.0
C	0.241	40	100	6.4	139.7	139.7	140.3	0.6
D	0.252	105	170	3.8	141.4	141.4	141.7	0.3
E	0.260	90	180	3.3	142.0	142.0	143.0	1.0
F	0.265	60	200	2.9	142.0	142.0	143.0	1.0
G	0.416	75	240	2.4	143.0	143.0	143.8	0.8
H	0.449	130	750	0.8	146.2	146.2	147.2	1.0
I	0.487	35	170	3.1	146.2	146.2	147.1	0.9
J	0.502	205	850	0.6	146.8	146.8	147.7	0.9
K	0.644	35	120	4.4	146.8	146.8	147.6	0.8
L	0.670	65	210	2.5	147.7	147.7	148.7	1.0
M	0.764	45	100	4.6	149.3	149.3	150.1	0.8
N	0.781	55	200	2.3	149.6	149.6	150.6	1.0
O	0.890	55	160	2.9	150.7	150.7	151.7	1.0
P	0.966	40	85	5.4	152.7	152.7	153.0	0.3
Q	1.042	35	95	4.2	154.8	154.8	155.2	0.4

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MARIPOSA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Morrison Creek								
A	12.358	118	679	4.3	47.5	47.5	47.8	0.3
B	12.539	74	549	5.4	47.9	47.9	48.6	0.7
C	12.701	87	569	5.2	48.8	48.8	49.8	1.0
D	12.868	351	1,189	2.5	50.7	50.7	51.7	1.0
E	13.143	350	1,321	2.2	51.8	51.8	52.8	1.0
F	13.469	326	1,277	2.0	53.3	53.3	54.2	0.9
G	13.611	378	1,515	1.7	53.6	53.6	54.6	1.0
H	13.830	298	1,065	2.5	54.1	54.1	55.1	1.0
I	13.995	417	1,830	1.5	54.8	54.8	55.8	1.0
J	14.274	631	2,061	1.4	55.0	55.0	56.0	1.0
K	14.470	287	864	3.3	55.5	55.5	56.5	1.0
L	14.730	144	928	3.0	56.3	56.3	57.3	1.0
M	14.879	103	596	4.7	58.5	58.5	59.1	0.6
N	15.031	169	720	3.9	59.2	59.2	60.1	0.9
O	15.197	517	1,797	1.6	59.6	59.6	60.6	1.0
P	15.397	126	693	4.1	60.0	60.0	61.0	1.0
Q	15.502	63	510	5.5	61.6	61.6	62.5	0.9
R	15.682	218	1,023	2.7	62.6	62.6	63.4	0.8
S	15.928	592	1,638	1.7	62.8	62.8	63.6	0.8
T	16.173	308	298	4.8	63.1	63.1	63.9	0.8
U	16.375	181	489	2.9	64.9	64.9	65.9	1.0
V	16.579	259	1,003	1.4	65.3	65.3	66.3	1.0
W	16.681	74	429	3.3	65.3	65.3	66.3	1.0
X	16.929	94	460	3.1	65.9	65.9	66.9	1.0
Y	17.137	51	308	4.6	66.7	66.7	67.7	1.0
Z	17.324	82	330	4.3	68.6	68.6	69.2	0.6

¹Stream Distance in Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MORRISON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Morrison Creek (cont.)								
AA	17.522	83	367	4.0	70.3	70.3	70.7	0.4
AB	17.679	75	370	3.9	71.1	71.1	71.6	0.5
AC	18.069	334	582	2.5	72.4	72.4	73.4	1.0
AD	18.413	122	347	4.2	74.5	74.5	75.5	1.0
AE	18.557	90	278	5.2	77.1	77.1	78.0	0.9
AF	18.709	206	351	4.1	80.0	80.0	81.0	1.0
AG	18.817	73	220	6.6	82.5	82.5	83.4	0.9
AH	18.929	98	364	4.0	85.0	85.0	85.7	0.7

¹Stream Distance in Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MORRISON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas East Drainage Canal								
A	4.858	55	280	2.3	12.2	12.2	13.1	0.9
B	5.000	50	300	2.1	12.4	12.4	13.3	0.9
C	5.250	50	300	2.1	12.7	12.7	13.6	0.9
D	5.500	55	320	1.9	13.0	13.0	13.9	0.9
E	5.750	60	360	1.7	13.2	13.2	14.1	0.9
F	6.000	70	200	3.1	13.6	13.6	14.5	0.9
G	6.250	100	400	1.6	13.8	13.8	14.8	1.0
H	6.500	250	800	0.8	13.9	13.9	14.9	1.0
I	6.750	350	900	0.7	14.0	14.0	15.0	1.0
J	6.970	250	750	0.8	14.0	14.0	15.0	1.0
K	7.044	70	370	1.7	14.0	14.0	15.0	1.0
L	7.087	100	600	0.9	14.0	14.0	15.0	1.0
M	8.589	950	1,000	0.6	14.6	14.6	15.6	1.0
N	8.825	650	1,000	0.6	14.9	14.9	15.9	1.0
O	9.072	650	1,000	0.6	15.2	15.2	16.2	1.0
P	9.325	600	900	0.6	15.3	15.3	16.3	1.0
Q	9.575	600	900	0.6	15.4	15.4	16.4	1.0
R	9.825	600	1,000	0.6	15.5	15.5	16.5	1.0
S	10.000	600	900	0.6	15.6	15.6	16.6	1.0

¹Miles Above Mouth

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	FLOODWAY DATA
		NATOMAS EAST DRAINAGE CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas East Main Drainage Canal								
A	7.580	1,850 ²	N/A	N/A	33.1	33.1	34.1	1.0
B	8.380	500	N/A	N/A	33.1	33.1	34.1	1.0
C	8.680	1,200	N/A	N/A	33.1	33.1	34.1	1.0
D	9.260	780	N/A	N/A	33.1	33.1	34.1	1.0
E	9.810	150	N/A	N/A	33.1	33.1	34.1	1.0
F	10.415	400	N/A	N/A	33.1	33.1	34.1	1.0
G	10.530	210	N/A	N/A	33.1	33.1	34.1	1.0
H	11.225	200	N/A	N/A	33.1	33.1	34.1	1.0
I	11.820	520	N/A	N/A	33.1	33.1	34.1	1.0

¹Miles Above Mouth ²Width Does Not Include Islands in the Floodway

**TABLE
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FEDERAL EMERGENCY MANAGEMENT AGENCY
SACRAMENTO COUNTY, CA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS EAST MAIN DRAINAGE CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas East Main Drainage Canal Tributary 1								
A	1.135	70	200	4.5	33.2	33.2	34.2	1.0
B	1.324	60	130	6.9	35.3	35.3	35.6	0.3
C	1.431	95	440	2.1	38.9	38.9	39.4	0.5
D	1.450	55	230	3.8	39.5	39.5	39.7	0.2
E	1.566	90	310	2.8	39.5	39.5	40.2	0.7
F	1.624	90	300	2.9	40.3	40.3	41.0	0.7
G	1.702	75	230	3.7	40.4	40.4	41.4	1.0
H	1.880	100	300	2.9	41.9	41.9	42.7	0.8
I	2.080	100	260	3.3	42.6	42.6	43.5	0.9
J	2.273	65	380	2.2	49.6	49.6	50.1	0.5
K	2.430	95	300	2.8	50.2	50.2	51.0	0.8
L	2.500	65	160	5.1	50.6	50.6	51.4	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS EAST MAIN DRAINAGE CANAL TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas East Main Drainage Canal Tributary 2								
A	0.700	110	220	3.6	33.2	33.2	34.2	1.0
B	0.900	105	220	3.6	33.7	33.7	34.2	0.5
C	1.125	110	250	3.1	35.8	35.8	36.7	0.9
D	1.275	40	120	6.6	37.3	37.3	37.9	0.6
E	1.394	115	550	1.4	41.3	41.3	41.5	0.2
F	1.568	70	420	1.7	42.8	42.8	42.9	0.1
G	1.776	75	360	2.0	43.4	43.4	43.7	0.3
H	1.875	70	320	2.2	43.4	43.4	43.8	0.4
I	2.000	55	210	3.3	43.4	43.4	44.0	0.6
J	2.201	75	440	1.3	47.3	47.3	48.1	0.8
K	2.375	70	350	1.6	47.3	47.3	48.2	0.9
L	2.527	75	290	1.8	47.4	47.4	48.4	1.0
M	2.689	50	140	3.7	48.7	48.7	49.4	0.7
N	2.875	25	80	6.6	50.8	50.8	51.6	0.8
O	2.939	45	140	3.6	51.6	51.6	52.3	0.7

¹Miles Above Mouth

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS EAST MAIN DRAINAGE CANAL TRIBUTARY 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas East Main Drainage Canal Tributary 3								
A	0.711	170	740	0.8	33.2	33.2	34.2	1.0
B	0.820	250	810	0.7	33.2	33.2	34.2	1.0
C	0.938	55	210	2.9	34.0	34.0	34.7	0.7
D	0.962	75	380	1.3	35.3	35.3	36.3	1.0
E	1.100	45	180	2.8	35.3	35.3	36.2	0.9
F	1.241	55	230	2.2	39.4	39.4	39.4	0.0
G	1.345	60	300	1.6	39.7	39.7	40.5	0.8
H	1.500	50	190	2.6	39.8	39.8	40.7	0.9
I	1.676	75	280	1.6	41.9	41.9	42.9	1.0
J	1.800	110	100	4.5	42.9	42.9	43.0	0.1
K	1.925	85	200	2.3	43.5	43.5	44.3	0.8
L	2.053	85	140	3.2	45.6	45.6	46.6	1.0
M	2.180	90	750	0.6	53.7	53.7	53.7	0.0
N	2.369	75	530	0.8	53.7	53.7	53.7	0.0
O	2.550	65	340	1.2	53.7	53.7	53.7	0.0
P	2.750	55	190	1.9	53.7	53.7	53.9	0.2
Q	2.890	50	150	2.4	53.7	53.7	54.1	0.4
R	2.960	55	140	2.5	53.8	53.8	54.3	0.5
S	3.045	60	100	3.6	55.6	55.6	56.5	0.9
T	3.160	70	130	2.4	56.0	56.0	57.0	1.0
U	3.280	60	120	2.6	56.3	56.3	57.1	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS EAST MAIN DRAINAGE CANAL TRIBUTARY 3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas Main Drainage Canal								
A	0.057	110	900	1.1	8.1	8.1	9.3	1.2
B	0.672	100 ²	700	1.5	8.3	8.3	9.5	1.2
C	0.700	100 ²	650	1.7	8.3	8.3	9.5	1.2
D	1.222	100 ²	550	2.0	8.7	8.7	9.9	1.2
E	1.291	100 ²	450	2.3	8.7	8.7	9.9	1.2
Natomas North Drainage Canal								
A	0.035	100	N/A	N/A	22.9	22.9	23.9	1.0
B	0.400	1,600	N/A	N/A	22.9	22.9	23.9	1.0
C	0.800	3,100	N/A	N/A	22.9	22.9	23.9	1.0
D	1.200	250	N/A	N/A	22.9	22.9	23.9	1.0

¹Miles Above Mouth ²This Width Extends Beyond Corporate Limits

TABLE
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FEDERAL EMERGENCY MANAGEMENT AGENCY
SACRAMENTO COUNTY, CA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS MAIN DRAINAGE CANAL - NATOMAS NORTH DRAINAGE CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas West Drainage Canal								
A	.009	40 ²	170	1.6	8.7	8.7	9.9	1.2
B	.250	40 ²	210	1.3	9.0	9.0	10.0	1.0
C	.500	55 ²	260	1.1	9.2	9.2	10.2	1.0
D	.640	50 ²	290	1.0	9.3	9.3	10.3	1.0
E	1.250	60 ²	450	0.3	11.6	11.6	12.5	0.9
F	1.500	70 ²	470	0.3	11.6	11.6	12.5	0.9
G	1.765	65 ²	500	0.3	11.6	11.6	12.5	0.9
H	1.799	100 ²	580	0.1	11.8	11.8	12.8	1.0
I	2.064	90 ²	620	0.1	11.8	11.8	12.8	1.0
J	2.250	100 ²	800	1.0	11.8	11.8	12.8	1.0
K	2.500	100 ²	840	0.1	11.9	11.9	12.9	1.0
L	2.750	120 ²	950	0.1	11.9	11.9	12.9	1.0
M	3.000	230 ²	2,400	0.1	11.9	11.9	12.9	1.0
N	3.324	300 ²	2,600	0.1	11.9	11.9	12.9	1.0
O	3.615	150 ²	1,000	0.1	11.9	11.9	12.9	1.0
P	3.646	100	850	0.3	12.0	12.0	12.9	0.9
Q	3.750	90	800	0.3	12.0	12.0	12.9	0.9
R	4.000	110	800	0.3	12.0	12.0	12.9	0.9
S	4.242	480	1,200	0.2	12.0	12.0	12.9	0.9
T	4.500	850	2,600	0.1	12.0	12.0	12.9	0.9
U	4.750	1,150	3,000	0.1	12.0	12.0	12.9	0.9
V	4.981	1,250	4,300	0.1	12.1	12.1	13.0	0.9
W	5.200	900	1,700	0.1	12.1	12.1	13.0	0.9
X	5.356	650	1,600	0.1	12.2	12.2	13.1	0.9
Y	5.388	650	1,600	0.1	12.3	12.3	13.2	0.9
Z	5.500	800	1,900	0.1	12.3	12.3	13.2	0.9

¹Miles Above Mouth

²This Width Extends Beyond Corporate Limits

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS WEST DRAINAGE CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Natomas West Drainage Canal (Continued)								
AA	5.750	1,150	3,100	0.1	12.4	12.4	13.3	0.9
AB	5.985	1,200	3,600	0.1	12.4	12.4	13.3	0.9
AC	6.250	950	1,900	0.1	12.5	12.5	13.4	0.9
AD	6.411	600	750	0.1	12.5	12.5	13.4	0.9
AE	6.710	550	680	0.1	12.5	12.5	13.4	0.9
AF	6.733	550	720	0.1	12.5	12.5	13.4	0.9
AG	7.000	550	950	0.1	12.5	12.5	13.4	0.9
AH	7.273	450	750	0.1	12.5	12.5	13.4	0.9
AI	7.343	650	1,600	0.1	12.5	12.5	13.4	0.9
AJ	7.500	720	1,800	0.1	12.5	12.5	13.4	0.9
AK	7.756	700	1,650	0.1	12.6	12.6	13.5	0.9
AL	7.780	680	1,600	0.1	12.6	12.6	13.5	0.9
AM	8.000	480	1,250	0.1	12.6	12.6	13.5	0.9
AN	8.250	240	750	0.6	13.2	13.2	14.0	0.8
AO	8.541	220	250	1.8	13.8	13.8	14.8	1.0

¹Miles Above Mouth

**TABLE
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FEDERAL EMERGENCY MANAGEMENT AGENCY
SACRAMENTO COUNTY, CA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NATOMAS WEST DRAINAGE CANAL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Robla Creek								
A	2.462	160	500	1.9	39.7	39.7	40.6	0.9
B	2.678	100	410	2.3	42.7	42.7	43.4	0.7
C	2.900	100	400	2.4	43.1	43.1	44.1	1.0
D	3.248	150	560	1.6	46.3	46.3	47.3	1.0
E	3.295	120	530	1.7	46.4	46.4	47.4	1.0
F	3.422	140	590	1.5	47.7	47.7	48.1	0.4
G	3.716	200	900	0.9	49.3	49.3	49.7	0.4
H	3.920	50	160	5.3	49.3	49.3	49.8	0.5
I	4.176	60	200	4.1	53.6	53.6	54.6	1.0
J	4.489	90	340	2.5	53.7	53.7	54.6	0.9
K	4.617	100	400	2.0	56.9	56.9	57.4	0.5
L	4.716	130	460	1.8	56.9	56.9	57.5	0.6
M	4.939	30	190	4.4	59.1	59.1	59.6	0.5
N	4.970	30	170	4.9	59.7	59.7	60.0	0.3
O	5.398	60	260	3.2	61.1	61.1	62.1	1.0
P	5.805	40	180	4.5	64.4	64.4	64.8	0.4
Q	5.898	40	150	5.4	65.7	65.7	65.9	0.2
R	5.956	70	280	2.9	66.9	66.9	66.9	0.0
S	6.061	150	460	1.8	67.2	67.2	67.3	0.1
T	6.193	200	380	2.1	67.4	67.4	67.5	0.1
U	6.402	160	280	2.9	68.2	68.2	68.2	0.0
V	6.487	30	100	8.1	70.4	70.4	70.4	0.0
W	6.610	30	160	5.0	71.9	71.9	72.5	0.6
X	6.779	70	350	2.3	72.5	72.5	73.3	0.8
Y	6.900	30	130	5.7	72.6	72.6	73.4	0.8
Z	7.000	40	200	3.7	75.6	75.6	76.2	0.6

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ROBLA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Robla Creek (Continued)								
AA	7.130	60	250	3.0	76.2	76.2	76.8	0.8
AB	7.282	80	430	1.7	81.6	81.6	82.3	0.7
AC	7.415	40	200	3.7	81.7	81.7	82.3	0.6
AD	7.575	40	200	3.5	84.5	84.5	85.4	0.9
AE	7.765	50	230	2.9	84.8	84.8	85.7	0.9
AF	7.837	40	160	4.1	84.9	84.9	85.7	0.8
AG	8.021	40	180	3.7	88.2	88.2	88.6	0.4
AH	8.284	30	130	4.8	92.0	92.0	92.0	0.0
AI	8.330	30	130	4.9	93.2	93.2	93.8	0.6
AJ	8.576	30	170	3.5	97.0	97.0	97.2	0.2
AK	8.744	40	190	3.0	98.5	98.5	98.7	0.2

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ROBLA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
San Juan Creek								
A	0.038	60	300	3.4	131.5	131.5	132.5	1.0
B	0.147	55	260	3.8	131.6	131.6	132.6	1.0
C	0.230	75	340	3.0	132.4	132.4	133.4	1.0
D	0.291	45	160	6.9	133.2	133.2	133.8	0.6
E	0.304	25	120	7.9	134.5	134.5	134.5	0.0
F	0.340	20	140	6.6	135.7	135.7	136.0	0.3
G	0.379	35	140	4.3	135.9	135.9	136.9	1.0
H	0.420	100	450	2.1	136.1	136.1	137.1	1.0
I	0.455	70	270	3.5	136.2	136.2	137.2	1.0
J	0.492	50	210	4.4	136.8	136.8	137.7	0.9
K	0.530	60	250	3.9	137.3	137.3	138.3	1.0
L	0.568	75	360	2.7	138.8	138.8	139.8	1.0
M	0.610	110	400	2.3	139.0	139.0	140.0	1.0
N	0.642	115	480	2.0	139.3	139.3	140.3	1.0
O	0.682	105	350	2.8	140.4	140.4	141.1	0.7
P	0.720	100	410	2.3	140.6	140.6	141.4	0.8
Q	0.758	45	200	4.6	140.7	140.7	141.5	0.8
R	0.796	80	220	6.4	140.7	140.7	141.5	0.8
S	0.831	20	80	11.7	141.7	141.7	141.7	0.0
T	0.870	20	110	8.5	142.7	142.7	143.1	0.4
U	0.910	20	90	10.2	142.7	142.7	143.2	0.5
V	0.937	25	180	5.1	145.3	145.3	145.8	0.5
W	0.947	30	170	5.7	145.3	145.3	145.8	0.5
X	0.994	30	140	6.9	145.3	145.3	145.9	0.6
Y	1.031	30	150	5.8	145.6	145.6	146.0	0.4
Z	1.129	30	123	7.0	146.1	146.1	146.1	0.0

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

SAN JUAN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
San Juan Creek (Continued)								
AA	1.155	30	117	7.4	146.1	146.1	146.8	0.7
AB	1.174	25	113	7.7	146.2	146.2	146.7	0.5
AC	1.222	30	110	8.1	146.5	146.5	146.9	0.4
AD	1.245	50	210	3.8	148.3	148.3	148.3	0.0
AE	1.324	50	170	4.6	148.5	148.5	148.7	0.2
AF	1.415	50	140	6.3	149.5	149.5	149.5	0.0
AG	1.504	50	150	5.7	150.7	150.7	150.9	0.2
AH	1.580	40	110	6.9	151.8	151.8	152.2	0.4
AI	2.338	N/A	N/A	N/A	164.6	164.6	N/A	N/A

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

SAN JUAN CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Sierra Creek								
A	0.104	50	350	2.4	66.7	66.7	66.7	0.0
B	0.208	50	240	3.5	66.7	66.7	66.7	0.0
C	0.313	55	130	6.5	66.7	66.7	66.7	0.0
D	0.407	50	140	6.1	66.7	66.7	66.7	0.0
E	0.426	50	200	4.3	66.8	66.8	67.0	0.2
F	0.535	40	130	6.5	67.7	67.7	68.0	0.3
G	0.650	35	130	6.5	68.8	68.8	69.3	0.5
H	0.770	40	140	6.1	70.4	70.4	70.8	0.4
I	0.885	40	170	5.0	72.5	72.5	72.9	0.4
J	1.000	40	170	5.0	73.9	73.9	74.3	0.4

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

SIERRA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Strawberry Creek								
A	0.189	34	184	3.1	22.4 ²	22.2	22.2	0.0
B	0.330	29	116	4.9	23.9	23.9	23.9	0.0
C	0.555	130	384	1.2	26.6	26.6	27.5	0.9
D	0.727	28	90	5.3	27.5	27.5	27.7	0.2
E	0.890	90	289	1.6	28.2	28.2	28.9	0.7
F	1.040	81	266	1.7	28.3	28.3	29.1	0.8
G	1.287	54	186	2.5	28.9	28.9	29.7	0.8
H	1.469	100	289	1.6	30.8	30.3	31.2	0.4
I	1.645	95	271	1.5	30.8	30.8	31.5	0.7
J	1.878	26	97	4.2	31.7	31.7	32.4	0.7
K	2.065	136	349	1.2	32.5	32.5	33.5	1.0
L	2.243	24	107	3.8	32.9	32.9	33.9	1.0
M	2.450	88	214	1.1	34.5	34.5	35.1	0.6
N	2.646	47	138	1.7	36.5	36.5	36.7	0.2
O	2.844	83	212	1.1	37.4	37.4	38.0	0.6

¹Stream Distance in Miles Above Mouth

²Water-Surface Elevation Computed for the Case When Levee Overtopping Begins

TABLE
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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

STRAWBERRY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Strong Ranch Slough								
A	0.280	50	490	2.9	33.1	33.1	34.1	1.0
B	0.380	50	480	3.0	33.1	33.1	34.1	1.0
C	0.470	50	450	3.1	33.1	33.1	34.1	1.0
D	0.610	110	510	4.7	33.9	33.9	34.1	0.2
E	0.780	200	1,400	1.7	34.2	34.2	34.7	0.5
F	1.000	210	1,290	1.7	34.4	34.4	35.0	0.6
G	1.100	90	540	4.2	34.9	34.9	35.8	0.9
H	1.300	90	540	4.2	35.7	35.7	36.7	1.0
I	1.370	40	220	10.4	36.1	36.1	36.4	0.3
J	1.500	40	230	10.0	37.0	37.0	37.2	0.2
K	1.620	40	220	10.5	37.7	37.7	37.9	0.2
L	1.800	40	250	9.1	39.6	39.6	39.6	0.0
M	2.010	50	450	4.7	41.6	41.6	41.7	0.1
N	2.120	50	390	5.4	41.6	41.6	41.8	0.2
O	2.200	40	310	6.8	42.1	42.1	42.1	0.0
P	2.350	40	250	8.7	42.6	42.6	43.1	0.5
Q	2.500	40	310	6.9	44.7	44.7	45.7	1.0
R	2.650	40	380	5.5	46.9	46.9	47.2	0.3
S	2.770	50	510	3.9	47.9	47.9	48.6	0.7
T	2.880	70	660	3.0	48.2	48.2	49.0	0.8
U	3.030	50	480	4.1	48.3	48.3	49.1	0.8
V	3.110	60	470	4.2	48.7	48.7	49.7	1.0
W	3.180	50	380	5.2	48.9	48.9	49.8	0.9
X	3.300	80	620	3.2	49.2	49.2	50.2	1.0
Y	3.480	30	280	7.0	49.4	49.4	50.2	0.8
Z	3.660	80	460	4.3	51.7	51.7	52.5	0.8

¹Miles Above Mouth

TABLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

STRONG RANCH SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Strong Ranch Slough (Continued)								
AA	3.830	70	580	3.2	54.1	54.1	54.4	0.3
AB	3.990	60	510	3.6	54.5	54.5	54.9	0.4
AC	4.240	70	470	3.5	55.6	55.6	56.2	0.6
AD	4.470	40	250	6.6	56.7	56.7	57.5	0.8
AE	4.580	30	210	6.8	57.8	57.8	58.8	1.0
AF	4.730	30	220	6.3	59.4	59.4	59.9	0.5
AG	4.960	50	270	5.1	60.7	60.7	61.6	0.9
AH	5.150	100	330	3.5	65.4	65.4	65.8	0.4
AI	5.270	20	150	7.9	65.8	65.8	66.8	1.0
AJ	5.430	30	330	3.6	68.7	68.7	69.7	1.0
AK	5.590	30	180	5.3	68.9	68.9	69.8	1.0
AL	5.720	30	150	6.3	68.9	68.9	69.9	1.0
AM	5.960	20	90	11.3	74.3	74.3	74.5	0.2
AN	6.170	20	80	11.7	79.0	79.0	79.0	0.0
AO	6.370	40	190	5.1	81.7	81.7	82.7	1.0
AP	6.440	30	120	8.1	82.2	82.2	82.8	0.6

¹Miles Above Mouth

TABLE
2

FEDERAL EMERGENCY MANAGEMENT AGENCY
SACRAMENTO COUNTY, CA
(UNINCORPORATED AREAS)

FLOODWAY DATA

STRONG RANCH SLOUGH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Unionhouse Creek								
A	3.597	37	164	4.2	26.6 ²	25.2	26.0	0.8
B	3.779	84	260	2.8	27.2 ²	27.0	27.7	0.7
C	3.973	89	389	1.9	27.6	27.6	28.4	0.8
D	4.143	121	379	2.0	28.0	28.0	28.9	0.9
E	4.346	122	469	1.6	30.0 ²	29.9	30.8	0.9
F	4.537	37	243	2.5	30.3 ²	30.2	31.1	0.9
G	4.708	43	277	2.2	30.8	30.8	31.5	0.7
H	4.880	29	178	3.5	31.7	31.7	32.3	0.6
I	5.091	33	218	2.8	32.7	32.7	33.2	0.5
J	5.291	43	253	2.4	33.3	33.3	33.8	0.5
K	5.332	46	284	1.8	35.4	35.4	35.6	0.2
L	5.537	40	225	2.3	35.6	35.6	35.8	0.2
M	5.720	39	227	2.3	36.0	36.0	36.2	0.2
N	5.910	21	69	7.4	36.4	36.4	36.5	0.1
O	6.101	35	158	3.2	39.3	39.3	39.3	0.0
P	6.297	96	266	1.9	42.9	42.9	43.0	0.1
Q	6.486	49	182	2.8	43.3 ²	43.1	43.5	0.4

¹Stream Distance in Miles Above Mouth

²Water-Surface Elevation Computed for the Case When Levee Overtopping Begins

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

UNIONHOUSE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Verde Cruz Creek								
A	0.025	75	200	6.1	86.5	86.5	87.5	1.0
B	0.050	50	160	7.6	86.5	86.5	87.5	1.0
C	0.152	30	130	9.4	86.5	86.5	87.5	1.0
D	0.303	50	260	4.7	89.3	89.3	90.2	0.9
E	0.455	35	160	7.6	91.6	91.6	92.2	0.6
F	0.606	90	320	3.8	94.8	94.8	95.7	0.9
G	0.723	50	260	4.7	95.9	95.9	96.9	1.0
H	0.762	20	90	11.4	96.7	96.7	96.7	0.0
I	0.814	30	110	7.4	98.8	98.8	98.8	0.0
J	0.871	30	110	7.4	98.8	98.8	98.8	0.0
K	0.899	20	130	6.3	100.8	100.8	101.6	0.8
L	1.022	35	130	6.3	103.7	103.7	104.2	0.5
M	1.098	35	140	5.8	105.0	105.0	105.9	0.9
N	1.136	25	80	10.2	106.0	106.0	106.0	0.0
O	1.212	30	80	10.2	107.1	107.1	107.1	0.0
P	1.288	20	70	11.7	108.7	108.7	108.7	0.0
Q	1.313	30	130	6.3	112.0	112.0	113.0	1.0
R	1.424	20	70	10.8	113.5	113.5	113.5	0.0
S	1.458	35	130	8.0	114.9	114.9	115.9	1.0

¹Miles Above Mouth

TABLE

2

FEDERAL EMERGENCY MANAGEMENT AGENCY

SACRAMENTO COUNTY, CA

(UNINCORPORATED AREAS)

FLOODWAY DATA

VERDE CRUZ CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
(FEET NGVD)								
Whitehouse Creek								
A	0.152	173	675	0.7	26.3	26.02	27.02	1.0
B	0.468	286	791	0.6	26.4	26.12	27.12	1.0
C	0.627	145	319	1.6	26.5	26.42	27.42	1.0
D	0.853	88	261	1.6	27.2	27.12	28.12	1.0
E	1.010	61	168	2.5	27.9	27.9	28.9	1.0
F	1.163	94	243	1.7	29.3	29.3	30.0	0.7
G	1.256	115	314	1.4	30.0	30.0	30.6	0.6
H	1.535	156	347	0.9	30.5	30.5	31.4	0.9
I	1.667	90	192	1.6	30.7	30.7	31.7	1.0
J	1.862	64	199	1.5	31.7	31.7	32.7	1.0
K	2.045	67	174	1.7	32.0	32.0	33.0	1.0
L	2.139	36	110	2.7	32.7	32.7	33.6	0.9
M	2.352	38	135	2.2	34.0	34.0	34.9	0.9
N	2.638	138	607	0.5	35.2	35.2	36.2	1.0
O	2.835	132	547	0.5	35.2	35.2	36.2	1.0
P	3.028	45	97	3.1	35.2	35.2	36.2	1.0
Q	3.223	75	206	1.5	36.2	36.2	37.2	1.0
R	3.393	108	256	1.2	37.3	37.3	38.2	0.9
S	3.477	314	114	1.8	41.5	41.5	42.5	1.0
T	3.605	69	312	0.6	41.5	41.5	42.5	1.0
U	3.684	150	535	0.4	41.6	41.6	42.6	1.0
V	3.748	160	610	0.2	41.6	41.6	42.6	1.0
W	3.945	77	69	1.4	42.9	42.9	43.2	0.3
X	4.107	148	448	0.2	45.3	45.3	46.3	1.0

¹Stream Distance in Miles Above Mouth

²Water-Surface Elevation Computed Without Consideration for Backwater Effects From Laguna Creek

TABLE 2	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	SACRAMENTO COUNTY, CA (UNINCORPORATED AREAS)	WHITEHOUSE CREEK

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but reduced the area of the pond and increased the water-surface elevation by 1.0 foot. No entries for area and velocity for the Natomas North Drainage Canal are included in Table 2 because the floodway was based on storage considerations rather than conveyance.

Floodwaters in the Natomas Main Drainage Canal are discharged to the Sacramento River by a battery of pumps. The required volume of storage during the 100-year flood, however, did not result in a water-surface elevation greater than the top of the banks of the canal. Large volumes of storage were present on both the Natomas East and West Drainage Canals. A floodway was determined for this system using equal-conveyance reduction on the East and West Canals and determining whether the extra volume generated at the pump outlet on the Main Drainage Canal would spill over the banks. It was found that a rise in the water-surface elevation of just under 1.0 foot in the East and West Canals would cause a rise of just over 1.0 foot in the Main Drainage Canal; however, the floodwaters would not overtop the banks of the Main Drainage Canal. The difference in water-surface elevation, as shown in Table 2, for every cross section on the Natomas Main Drainage Canal is in excess of 1.0 foot, but the overflow is contained within the banks.

The floodway on the Natomas East Main Drainage Canal upstream from Dry Creek was determined by the volumetric method and was delineated in consultation with Sacramento County officials. Floodwaters on Dry and Robla Creeks combine and flow into the Natomas East Main Drainage Canal. These flows will fill available storage upstream of Dry Creek. This storage is quite effective in reducing the peak flow rate in the canal downstream of Dry Creek. If the available storage along the canal and its tributaries is removed, the increased flow rates in the lower portions of the canal will raise the base flood elevation more than 1.0 foot. The excess rise, while not causing the overtopping of any levees downstream of Dry Creek, will raise the water surface more than 1.0 foot on the canal and its tributaries upstream of Dry Creek.

The volumetric method holds the rise in water surface to 1.0 foot. Area and velocity for the Natomas East Main Drainage Canal are not entered on Table 2 because the floodway was based on storage considerations rather than conveyance.

The interrelationship of Dry Creek, North Branch Dry Creek, Robla Creek, and the Natomas East Main Drainage Canal creates an extremely complex flow system when flooding occurs. North Branch Dry Creek spills water southerly to Dry Creek at many locations above the Western Pacific Railroad. At the railroad, a major amount of flow in Dry Creek discharges southerly to Robla Creek inside the City of Sacramento. Downstream of the railroad, North Branch Dry Creek again spills to Dry Creek, which in turn spills to Robla Creek. The process is again repeated below Rio Linda Boulevard in the City of Sacramento, with flows from Dry Creek overflowing to Robla Creek. Finally, waters in Dry Creek, Robla Creek, and the Natomas East Main Drainage Canal form a common

water-surface elevation as described previously in the discussion of the floodway on the Natomas East Main Drainage Canal.

The common floodway for Dry Creek and North Branch Dry Creek was determined by the volumetric method, utilizing the entire effective flow area of the flood plain. Floodway data are not presented for Cross Sections A to J because of the complex flow system in this area. Velocities shown in Table 2 at Cross Sections K to S are velocities in the channels. Velocity of the flow in transit from North Branch Dry Creek to Dry Creek is not included.

The base flood for many small watersheds in the American River Stream Group results from local cloudburst storms. These storms are not concurrent with storms affecting the stream to which the smaller creek is a tributary. Base flood elevations on the smaller streams near their confluences with larger ones were governed by backwater from the larger streams. Floodways on the smaller tributary streams were determined by equal-conveyance reduction using a discharge condition free of backwater influence at the confluence. Floodway data shown in Table 2 for tributary streams influenced by backwater from larger streams reflect topwidth, area, and velocity properties based on discharge conditions free of backwater effects. The data on water-surface elevations, however, are based on the corresponding floodway information determined for the larger streams. The above interpretation was used for data in Table 2 for Arcade (South Branch), Brooktree, Cripple, Mariposa, San Juan, Sierra, and Verde Cruz Creeks, and the Natomas East Main Drainage Canal Tributaries 1, 2, and 3.

Sheet flow occurs at the upstream limits of Magpie and San Juan Creeks. These flows must be permitted; they cannot be confined by a floodway without causing additional flooding downstream. Therefore, no floodway has been shown upstream of Walerga Road.

In the lowest reaches of Chicken Ranch and Strong Ranch Sloughs, floodways were determined by the volumetric method previously described. Because the discharge is pumped, volume must be allowed to ensure that the floodway causes not more than a 1.0-foot rise in base flood elevations.

Floodways are not established where excessive natural overflow losses escape from one stream basin to another, since containing the losses would result in exceeding allowable floodway criteria. A floodway was not designated for Morrison Creek from the CCTCRR tracks downstream because of the occurrence of overflow losses to Florin Creek. Floodways were not designated for Elder, Laguna and Unionhouse Creeks downstream of the area of occurrence of excessive overflow losses. These cannot be confined by a floodway without causing additional flooding downstream. Therefore, no floodway is shown for those portions of the respective floodplains. No floodways were computed for Gerber and North Fork Laguna Creeks.

No floodways have been established for the delta area portion of this study. Specifically, no floodway have been determined along

Sacramento River, Georgiana Slough, Streamboat Slough, Sutter Slough, Snodgrass Slough and other minor sloughs, the Mokelumne River, North Fork Mokelumne River, and the lower reach of San Joaquin River.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

Flood Plain Information reports for the Morrison Creek basin (Reference 21) and for northeastern Sacramento County (Reference 11) were prepared by the COE, Sacramento District. Comparison of the study with these studies was not possible because the earlier reports only displayed water-surface elevations of the standard project flood.

The SCWRD has prepared storm drainage studies for streams in the American River Stream Group (Reference 22). Flow rates used in those studies were based on a regional correlation analysis of stream gage data (Reference 25). Water-surface profiles and floodplains on various creeks are shown in the storm drainage studies. A comparison of this study with those storm drainage studies was not possible because the storm drainage studies were based on a 10-year flood under conditions of future development and future channel conditions. In this study, no allowance was made for long-term land-use changes or for long-term changes to the channel conditions.

Flood Insurance Studies have been prepared for the Cities of Sacramento, Galt, Folsom, and Isleton (References 26, 27, 28, 29, respectively) and adjacent San Joaquin County (Reference 30). These contiguous studies are in agreement with this Flood Insurance Study.

This study revises, updates, and supersedes a previous Flood Insurance Study for Sacramento County (Reference 31).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Building 105, Presidio of San Francisco, San Francisco, California 94129.

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